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# TRANSACTIONS

OF THE

# WORCESTER COUNTY

# HORTICULTURAL SOCIETY.

## REPORTS OF THE OFFICERS

FOR THE YEAR ENDING NOVEMBER 1, 1897,

AND

## ESSAYS FOR SEASON OF 1898.

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MASSACHUSETTS AGRICULTURAL COLLEGE

# WORCESTER COUNTY HORTICULTURAL SOCIETY,

## A. D. 1897.

## ANNUAL REPORT OF THE SECRETARY.

*To the Members of the*

WORCESTER COUNTY HORTICULTURAL SOCIETY:

IN presenting for your consideration the Annual Report of the proceedings of this Society, I am as well aware as yourselves that I am not qualified to wear the mantle that graced the Atlantean shoulders of our late Secretary, EDWARD WINSLOW LINCOLN, who for thirty-four years prepared a report as no other man could have done.

I can only hope to tell you what the Society has been able to accomplish in the interest of Horticulture during the year that has passed, and give you in detail a report of the meetings which have been held.

The annual meeting of the Society was held Wednesday, November 4; President O. B. Hadwen presiding.

The first business was the election of the officers, a list of which will be found on the covers of the various publications of the Society. The reports of the Treasurer, Librarian and Secretary were read and referred to the Committee on Publication.

*Voted*, That there should be no charge of admission for members to the Chrysanthemum Show.

Henry L. Parker, for the Committee on revision of By-Laws, reported, and after considerable discussion, it was voted to print

five hundred copies of the report, to be mailed to each member as far as their address may be known, and further discussion deferred until Thursday, January 7, 1897, at 2 o'clock, to which day and hour this meeting was adjourned.

E. W. LINCOLN, *Secretary.*

---

Annual Meeting of the Trustees called immediately upon the adjournment of the meeting of the Society; President O. B. Hadwen in the chair.

The first business was the election of committees and judges, a list of which will be found with the officers.

It was voted to appropriate the following sums for premiums:

| | |
|---|---|
| Flowers and Plants, . . . . . | $700 00 |
| Fruit, . . . . . | 600 00 |
| Vegetables, . . . . . | 400 00 |

with the addition of $300 to be divided between the departments for new features.

| | |
|---|---|
| For Library and Publications, . . | $250 00 |
| For Winter Meetings, . . . . . | 250 00 |

and Henry L. Parker, James Draper and F. A. Blake were appointed a committee to arrange for the same.

Also voted, That the judges remain a reasonable length of time after making their awards.

Dissolved.

E. W. LINCOLN, *Secretary.*

---

A special meeting of the Trustees was held on Wednesday, December 16, 1896, to take action on the death of Mr. Lincoln.

President O. B. Hadwen presided, and on motion of Mr. Paine, Mr. A. A. Hixon was elected Secretary *pro tem.*

The action of the Trustees at this meeting has already been printed and distributed to the members, so it seems unnecessary to repeat the details at this time.

---

The adjournment of the Annual Meeting was held on Thursday, January 7, 1897, for the consideration of the revision of

the By-Laws; also, for the election of officers to fill vacancies occasioned by the death of Mr. Lincoln.

President O. B. Hadwen presided, and the following were elected to fill the vacancies:—

*Secretary:*

ADIN A. HIXON.

*Member of the Finance Committee:*

HENRY L. PARKER.

*Member of the Library and Publication Committee:*

JOSEPH JACKSON.

Mr. James Draper tendered his resignation as Judge of Fruit.

It was voted to hold a Chrysanthemum exhibition.

As the question of revising the By-Laws at this meeting could only be considered, and that action could not be taken legally, it was voted to postpone further discussion until the next annual meeting. The Secretary was instructed to insert in the call for the meeting that a change in By-Laws would be considered. No other business was presented. The meeting was dissolved.

---

A special meeting of the Trustees legally called was held on Thursday, January 14, 1897, for the election of a Judge of Fruit, and the transaction of any other business properly presented.

The resignation of Mr. Draper as made at a previous meeting, upon which no action had been taken, was accepted, and a vote passed thanking him for his faithful service in the office he had so satisfactorily and impartially filled.

Henry Phelps was chosen to fill the vacancy.

It was voted, That the Committee on Library and Publication procure a picture of Mr. Lincoln and have the same bound with the transactions of the Society containing the last report of our late secretary.

Also; voted, That all entry-cards be made out by the Secretary or his Assistant.

It was further voted that Mr. Frederick H. Wesson who several years ago was debarred as an exhibitor be reinstated.

No other business being presented it was voted to adjourn.

---

A meeting of the Trustees legally called was held Saturday, February 27, 1897, to take action on the following letter:—

Worcester, Mass., *Feb. 18, 1897.*

Mr. Adin A. Hixon,
Secretary, Worcester County Horticultural Society.

Dear Sir:—At the meeting of the joint committees of the Massachusetts State Grange and Worcester Agricultural Society, held on Saturday, February 13, it was unanimously voted that an invitation be extended the Worcester County Horticultural Society to unite with the Massachusetts State Grange and the Worcester Agricultural Society in the holding of a joint Fair at Worcester, Aug. 31, Sept. 1st, 2d, 3d, 1897.

It would seem that in view of the objects which the several associations mentioned desire to obtain, that much benefit and pleasant associations could be secured by this coöperation at this time. Trusting the invitation may receive your early and favorable consideration,

I remain, yours repectfully,

JOHN B. BOWKER,
Secretary, Worcester Agricultural Society.

Pursuant to the above invitation, it was voted, That we accept the invitation of the Massachusetts State Grange and the Worcester Agricultural Society to unite with them in holding a joint fair on August 31st, September 1st, 2d and 3d, 1897, with the distinct understanding and upon condition that the Worcester County Horticultural Society should incur no financial responsibility in so doing. That this Society contribute the sum of one hundred dollars towards their premium list in the Horticultural Department. That we tender them the use of our hall and such other property of this Society as they may desire during the days of their fair.

Acknowledgment accepting the conditions as above stated was received from Secretary Bowker, March 10, 1897.

It was further voted, That this Society postpone its exhibition

of September 2 one week, and that on September 9 an exhibition be held embracing the schedule covering both dates.

Also; voted, To instruct the Librarian to prepare a list of members and have the same printed.

No other business being presented it was voted to adjourn.

---

A meeting of the Trustees legally called at the request of the Finance Committee was held Thursday, September 23, 1897, to consider suggestions made to the said committee by the Board of Underwriters concerning minor improvements to the property with a view to a reduction of rates on our building. To attend to a renewal of insurance expiring October 1, 1897, and such other suggestions as our Finance Committee might make, and take action thereon.

It was voted, That the Finance Committee be authorized to make such improvements as they may consider for the best interests of the Society, and to use so much of its funds as are necessary to complete the work, and to cause expiring insurance to be renewed.

It was further stated that the lease of the west store expires January 1, 1898, while the lease of the other does not expire until January 1, 1899.

The company occupying the east store have not sufficient room for the successful prosecution of their business, and desire a lease of both stores, provided they can be practically made into one store. The changes they require necessitate an alteration of the front of the stores and the removal of part of the division wall.

Voted, That the Finance Committee be authorized to make the required changes, and to lease the stores provided the same shall not be less than the present annual rental with the addition of a reasonable percentage of the cost of making the changes. And that they have full power to act and borrow such sums as may be necessary to complete the work.

Also; voted, To instruct the Secretary to notify members of the annual meeting by postal card.

The above in brief is the action of those who have the management of the business of this corporation.

Heretofore this has been dealt with in a general way. I believe every member of the Society should know what has been done by its trustees and others authorized by them to transact their business, without being obliged to refer to the secretary's records. I have therefore incorporated the same in this report.

The Society has received from the executors of the will of our late Secretary, Edward Winslow Lincoln, his portrait, by Billings, which was bequeathed by him to us, and speaks more eloquently of his affection for this Society than any other of his many acts of devotion to its interest. I think every member feels a sense of obligation as well as gratitude to Edward Winslow Lincoln for this beautiful gift — a fit sequel to all he has done to win our love and thanks. The hours he has given to advance the interests of this Society as well as to inculcate in every heart the love of horticulture, his affection for every tree and shrub and flower, and his devotion to their intelligent cultivation and care, have won the admiration of all with whom he came in contact — either as the foremost representative of our organization, or in his broader capacity as chairman of the Parks-Commission which he served so faithfully.

Among our number whom death has claimed during the past year is Mr. Freeman M. Marble, who has long been identified with this Society, and was always active and earnest in its support. For many years a prominent contributor of some varieties of fruit, and a man of most excellent judgment. He served faithfully many years on various committees and on the Board of Trustees. He was one of the first to recognize the merits of the Bosc pear, and through his efforts it is more largely grown than any other pear, and it has proved to be one of the best for this locality.

WINTER MEETINGS.—The essays, so far as they were written, are already in your hands, in print, and are equal to those of former years.

We were unfortunate in not securing better reports of the essays of Messrs. Ellsworth, Sawyer and Bailey, —each spoke extemporaneously, having no manuscript. They were interesting and instructive and should have been preserved entire, and I would suggest that the committee having the winter meetings in charge employ a stenographer, that all the essays may be preserved, together with such suggestions as the discussion following may bring out. Many statements relative to the success or failure of plant growth are presented in these discussions, that, if preserved, would be of practical advantage to our members.

We have been pleased with the interest taken in this year's series of meetings. The attendance has largely increased, and if it continues the coming winter will make it necessary to use the main hall, as the capacity of the Library was taxed to its utmost to accommodate those present.

Of the exhibitions held this year they have been far better than usual. At our first exhibition, the show of apples was in excess of anything heretofore shown. Over one hundred and fifty plates were on our tables, embracing nearly every variety grown in the country whose keeping qualities, unaided by the improved methods of cold storage, were sufficient to carry them through the season.

The following month many of the same varieties were on exhibition. There has never been a year when the exhibits were of better quality, and there was a noticeable absence of anything inferior in fruit, flower or vegetable.

At the date of the schedule for roses there were but four contributors, owing entirely to the lateness of the season; and by the consent of those exhibiting, gratuities were awarded, and the competition carried over to the next week, at which time one of the best exhibitions of roses was held. Strawberries were a little late this year but the showing was good.

The show of peaches was unusually fine, and the quality of

the fruit was much better than for many previous years. The showing this year would indicate that the Japanese plum was to be an important factor in that particular branch of fruit culture. There seemed to be but little if any appearance of blight or curculio.

In pears, the exhibitions of Anjou and Bosc were particularly fine, while all the varieties were fully up to the average.

Mr. H. A. Cook of Shrewsbury and Mr. F. A. Blake of Rochdale showed seedling carnations of their own raising which were very meritorious, and a Certificate of Merit was awarded to each.

Mr. O. B. Hadwen placed on exhibition 12 stalks of Monarch Rhubarb which weighed 22½ pounds.

The Protective Union showed a plate of oranges, grown in California, to which was awarded a gratuity; the 12 on exhibition weighing 15 pounds, while the box containing 64 weighed 78 pounds.

The Exhibitions of Wild Flowers were a success, and the uncultivated were a splendid addition to the display grown by florists and amateurs.

On one occasion one person contributed 164 varieties. The inducements offered by our Society for their collection is certainly an advantage; if for no other reason, it is conducive to the health as well as the pleasure of those who strive to win its prizes, and must bring in its results an increasing and abiding love for horticulture, and at no distant day I look to see among our best exhibitors of the garden varieties those who commenced by bringing those grown in our fields and woods.

For the first time in the history of this Society, premiums were offered for native mushrooms and it has proven a success. The interest taken in Mycology, as a special study, has been something beyond the expectations of the most sanguine in that department.

The study to discriminate between the edible and the poisonous mushrooms has been carried on with an enthusiasm never dreamed of by those who first suggested that this Society, for a brief term, add it to the schedule. The interest continued un-

abated until the season had entirely passed in which any recognition could be expected in the way of premiums, and for many weeks, when they were omitted from our schedule, hundreds of varieties were shown upon our tables.

That this feature of our exhibition has come to stay admits of no question, and the result seems to be that an effort will be made to procure in larger quantities the edible varieties for use in the homes of our members.

I am glad this matter has been encouraged by us, and hope the same may be continued in a larger way hereafter, that whatever of good comes through it, we may be among the pioneers in pushing its development.

It may not be known to all the members of this Society that at the time of the organization of the Massachusetts Fruit Growers' Association, the Finance Committee, through its chairman, Mr. Lincoln, tendered its promoters the use of our rooms with the understanding that the annual meeting of said Association should be held in this city. By an understanding between the executive officers of the two societies, it has been so arranged that their annual meeting should occur at the time of our reunion, and its officers, by this plan, have in some sense been, on that occasion, the guests of the Society.

We have received from the Fruit Growers' Association, through their officers, thanks for the courtesies received, and expressions of gratitude for the favors extended to them.

There are two other societies whose membership is largely drawn from this Society, and known as the Worcester County Market Gardeners' Association, and Worcester Mycological Society, who occupy our rooms for their meetings.

Both of these societies are aids rather than hindrances to the work of this Society, each covering an important line of work and science of horticulture, and each are entitled to all the aid we can give them.

There has not been the slightest objection or criticism of the action thus far taken towards them, nor is there any probability of any being made should the same practice continue in the future, but there are some who feel that the importance of the

field which they fill, being auxiliary institutions to our own Society, calls for a tender to them of our rooms, by a vote of the Society, at such time as it will not interfere with our contracts.

The receipts from the Hall during the past year were within a few dollars of the largest ever obtained; and when we consider the depression in business of last winter and the number unemployed, who in former years and under other conditions were our best patrons, we feel that we have done all that could be expected of us. With the encouraging outlook for business prosperity in the near future, we feel that a better showing will be made the coming year.

In conclusion, I desire to thank the officers of the Society for their uniform courtesy, their timely suggestions and valuable assistance in the performance of the duties required by the office, and to each and all the members for their loyalty to the Society, and the devotion they have exhibited to the science of Horticulture.

Respectfully submitted.

A. A. HIXON, *Secretary.*

HORTICULTURAL HALL,
WORCESTER, MASS.,
*November 3, 1897.*

# REPORT OF THE LIBRARIAN.

To the Members of the
Worcester County Horticultural Society.

During the past year the Library has been open every day, proving a convenience, not only to those wishing to consult books and papers, but as a place of meeting for those interested in Horticulture and more especially to our members living out of the city.

The interest shown this season has been mostly in Mycology and Native Flowers; though the latter part of the season there has been considerable interest shown in Bees,—more particularly among those interested in artificial fertilization of plants.

The following Books, Periodicals, Papers and Bulletins have been added to the Library during the past year:—

United States Department of Agriculture: Farmers' Bulletin No. 54. Some common birds in their relation to Agriculture. 1897.

Accessions to the Department Library. Bulletins, October, 1896, to June, 1897.

Bulletin, October, 1897. A Bibliography of Poultry.

Reports of the U. S. Commissioner of Education; Vol. 1, 1894 and 1895. Vol. 1, 1895 and 1896.

Reports of the Civil Service Commission, United States: 10th, July 1, 1892, to June 30, 1893; 11th, July 1, 1893, to June 30, 1894.

Eleventh Census of the United States, 1890: Statistics of Agriculture. Agriculture by Irrigation. Statistics of Fisheries.

Report of Special Commission of the United States Senate on the Irrigation and Reclamation of Arid Land. Vols. 3 and 4 in one vol.

Field Columbian Museum Publications: Botanical Series, Publication 15, Vol. 1, No. 3. Annual report of the Director to the Board of Trustees, 1895 and 1896.

Monthly Bulletins of the Bureau of American Republics, November, 1896, December, 1896. Vol. 4, No. 5; Vol. 4, No. 6.

A Hand-Book on the Annexation of Hawaii, by Lorrin A. Thurston.

Report of Massachusetts State Board of Agriculture and Experimental Station, 1896; William R. Sessions, Secretary. 20 copies for distribution.

Massachusetts Crop Reports. Bulletins Nos. 1 to 6, inclusive.

Massachusetts Agricultural College, Amherst, Mass.

Hatch Experimental Station. Bulletins Nos. 42 to 48, inclusive.

Hatch Experimental Station, Ninth Annual Report, Jan. 1, 1897.

Meteorological Reports, Hatch Experimental Station. Bulletins Nos. 94 to 103, inclusive.

Cornell University Agricultural Experimental Station. Bulletins Nos. 122 to 128, inclusive.

Michigan Agricultural Experimental Station. Bulletins Nos. 136 to 140, inclusive.

New Jersey Agricultural Experimental Station. Bulletin No. 116.

West Virginia Agricultural Experimental Station. Bulletin No. 46.

Scientific American Supplement, Reference Catalogue. Munn & Co.

Who invented the Reaper? R. B. Swift.

Announcement of the Bussey Institute. Harvard University, 1897 and 1898.

Reports of the Trustees of Public Reservations, 4th, 1895, and 5th, 1896.

Worcester Society of Antiquity: F. P. Rice. Town Records, 1833 to 1836; 1836 to 1840; 1841 to 1844.

Old Worcester. From and by Lieut. Samuel Hathaway.

Report of the Board of Trade; Worcester, 1897. Secretary Squiers.

Report of the Worcester Parks Commission, Nov. 30, 1896. Edward Winslow Lincoln, Chairman.

Sargent's Sylva, Vol. X.

Illustrated Flora of the Northern States and Canada. Vol. 2. 1897. Britton & Brown.

A History of Gardening in England. 1896. Hon. Alicia Amherst.

The Water Garden. 1897. William Tricker.

Revue Horticole. French. 2 Vols. 1895 and 1896.

Mushrooms and their Uses. 1897. Charles H. Peck, State Botanist, New York.

British Fungi. 2 Vols. 1886. Rev. John Stevenson.

Students' Hand-Book of Mushrooms of America. Edible and Poisonous. Thomas Taylor, M.D. Pamphlet No. 1, 2, 3.

Exchanged with George E. Francis, M.D. For the Sphagnaceæ or Peat Mosses of Europe and North America. 1880. Braithwaite.

REGULAR PUBLICATIONS.

Amateur Gardening. Springfield, Mass.
American Florist.
American Gardening.
Country Gentleman.
Florist Exchange.
Farm and Garden.
Gardening.
Garden and Forest.
New England Homestead.
Massachusetts Ploughman.
Meehan's Monthly.
Rural New Yorker.
State Board of Health, Nashville, Tenn. Bulletins.
Worcester Daily Spy.
Worcester Daily Telegram.
*English:*
Agricultural Gazette.
Garden.
Gardener's Chronicle.
Gardening Illustrated.

Received from the "Country Gentleman" a picture of Luther H. Tucker, who died Feb. 23, 1897; editor-in-chief of that paper for 24 years. Which I have had framed and hung in the Library.

All of which is respectfully submitted.

ADIN A. HIXON, *Librarian.*

HORTICULTURAL HALL, WORCESTER, MASS.,
*October 31, 1897.*

# REPORT OF THE TREASURER.

The Treasurer of the Worcester County Horticultural Society presents his annual report, showing the receipts and disbursements for the year ending November 1, 1897.

The income derived from the rent of the Hall is about the same as for the previous year.

Fifteen hundred dollars has been paid on the mortgage loan of the Society during the year, and but for the fact that the trustees have authorized certain repairs and alterations in the building still more would have been paid. It is confidently expected that after the repairs have been made and paid for, there will be a larger reduction in the debt for the coming years.

The F. H. Dewey Fund is now $1081.80, having been increased a little the past year by the accumulation of interest, no charge having been made against it.

Nathaniel Paine, Treasurer, in account with

Worcester County Horticultural Society.

Dr.

| | | |
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| 1896. | | |
| Nov. 1. | Balance as per last report, | $2,330.85 |
| 1897. | | |
| Nov. 1. | Receipts to date: | |
| | From rent of stores, | $6,250.00 |
| | rent of Hall, | 4,790.00 |
| | membership fees, | 137.00 |
| | Chrysanthemum exhibition, | 155.50 |
| | For tickets to annual banquet, | 148.50 |
| | interest on bank deposit, | 77.50 |

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| Nov. 1. | Prizes for chrysanthemums: | | |
| | From O. B. Hadwen, | $25.00 | |
| | H. F. A. Lange, | 25.00 | |
| | F. B. Madaus, | 15.00 | |
| | F. A. Blake, | 15.00 | |
| | Edward Hall, | 15.00 | |
| | C. D. Thayer, | 15.00 | |
| | | | 110.00 |
| | Total, | | $13,999.05 |

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| 1897. | | | |
| Nov. 1. | Payments to date: | | |
| | City taxes and water rates, | $ 816.86 | |
| | Premiums paid, | 2,069.86 | |
| | Paid the judges, | 150.00 | |
| | for gas, | 1,003.19 | |
| | Salary of treasurer, | 150 00 | |
| | A. A. Hixon, | 1,333.33 | |
| | janitor, | 500.00 | |
| | A. A. Hixon (Hall expenses), | 305.19 | |
| | For card catalogue, | 84.70 | |
| | books and periodicals, | 28.42 | |
| | Sundry expenses (safe, &c.), | 165.97 | |
| | Repairs at Hall, | 484.09 | |
| | On account of annual banquet, | 257.80 | |
| | Paid on mortgage loan, | 1,500.00 | |
| | Interest on loan, | 502.92 | |
| | Paid for printing, publications, &c., | 409.28 | |
| | Total, | $9,761.61 | |
| 1897, Nov. 1. | Cash balance, | 4,237.44 | |
| | | | $13,999.05 |

NATHL. PAINE, *Treas.*

*November 3, 1897.*

WORCESTER, Nov. 8, 1897.

We the undersigned, Auditors of the Worcester County Horticultural Society, hereby certify that we have examined the account of the Treasurer, and find the same to be correct and properly vouched, and that the cash balance is accounted for.

F. H. CHAMBERLAIN.
HENRY L. PARKER.

# ESSAYS.

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A. D. 1898.

# WORCESTER COUNTY
# HORTICULTURAL SOCIETY.

6th January, A. D. 1898.

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## ESSAY

BY

O. B. HADWEN, President.

*Subject: — Rural Adornment with Trees and Plants.*

Here and there in the suburbs of cities and country towns are seen many attempts at rural andornment and ornamentation with trees and plants, delighting with their unexpectedness, and pleasing by their simplicity, and harmonizing with nature in every degree of landscape.

Also a neglect of these attractions is conspicuous along the highways and byways which are by far too manifest, by the utter want or neglect to use the means which God and nature and sunshine have so abundantly placed within our scope. And yet the trees, the flowers, the lawn, the water, and a thousand kindred charms which only await development when nature is assisted by man, are to ripen the instincts and cultivate the finer art of rural life, and encourage the more delicate graces of home and rural surroundings.

What prevents giving our farms, our homes, our public and private grounds, an air of simple or elaborate adornment, in accordance with the means and time at our disposal?

We may make our grounds, however situated, large or small in area, so fitted to its exposure, its altitude, its simplicity, so governed by judicious planting and neatness, so rich in leaf and flower, an enduring and refining feature in the landscape that

Heaven itself will commend, and sunshine and showers will nourish, and the passer-by will forever praise, and the grounds are themselves the primary and important feature in rural and city life.

The liberal use of deciduous and coniferous trees and plants is imperative in landscape art, but should be carefully studied and selected with a view to the most charming effect. It is an art that should be accompanied by practical training in planting the many different kinds of trees, widely differing in their habits, by exposure and soil, to thrive well, and for years. Holes for trees and shrubs should be large and well prepared, giving the roots plenty of room for development, and a mound in the centre of the hole for the tree to rest upon, giving the lateral roots a downward tendency, and preventing an open space under the tree, an important feature very much neglected.

Judicious pruning should be given at the time of transplanting, vigorous pruning with hard wooded sorts, and while they are unsightly at first, they amply repay with increased growth and luxuriant foliage.

In planting parks with a view to their future development and general use for the public, the raw materials of no two parks or grounds can be found alike; good soil is one of the chief requisites for all grounds, if they are to be adorned with permanent trees or shrubs, to keep in harmony with the natural contour of surface, and the face of nature should be the guide to its embellishment. The higher art is simple in expression, and trees or plants should be placed in moist or dry situations, as experience teaches best suited to their growth and longevity. Planting for immediate effect or crowding trees together is not well adapted to openness, in part essential to permanent landscape. It must soon be followed by severe thinning out, the unshapely trees and shrubs always out of harmony where beauty should reign at every turn. For God makes the trees and man makes the harmony.

Parks are of use to bring the city and country in closer proximity, and to contribute the greatest enjoyment for the greatest number should be the law. The best parks are simple in their

expression, the best adornment is with groups of trees or shrubs found to thrive in the locality, either naturally or by art. Simplicity of design and economy of maintenance are essential conditions too often overlooked. If possible, ornamental water should be a feature, as no landscape is complete without ponds and bridges. Fountains and jets often are exceedingly beautiful, commending themselves to the well-trained eyes of practical people.

Now then, what are some of the best trees and shrubs to plant, for the development of landscape is always commensurate with the advancement of the most cultivated thinkers and general knowledge between numbers of men engaged in this pursuit?

The maples, both indigenous and exotic, comprise many sorts. Indeed, there is no family of trees more extensively planted or that gives greater satisfaction. Their shapely form and variety of foliage, with most exquisite coloring, renders them popular. Among the Norway family of maples the Schwedlerii is proving a great acquisition, with its robust habit of growth, large and luxuriant leaf opening in spring a bright crimson, unlike any other maple in its season, in autumn turning to a delicate bronze, in happy contrast with the autumnal tint of other trees.

Then there is the Reitenbachi, almost the exact counterpart of the Schwedlerii, opening green in spring and gradually turning to bright crimson in autumn.

The Geneva, a native of this country, of the Norway type, comes out a rich crimson purple in spring, retaining its color through the season.

The Sycamore maple, variety *Pupuria*, is of vigorous habit. The leaves are a fine green on the upper side and colored purple on the under side, a beautiful tree in a gentle wind.

The Ginnala is a charming maple of shrubby growth, with deeply cut leaves and intensely bright crimson in autumn.

I have growing on my place eighteen sorts of maples, giving great variety of form and coloring.

We have no more impressive tree than the oak, often retaining its foliage during the winter. They are more difficult of transplanting than the Maple. They require hard pruning when

planted, almost to the pole. The White oak, Scarlet oak, Red Oak, Yellow oak, Chestnut oak, Pine oak, are the leading sorts. There is no class of trees that grows so stately and are longer lived than the oaks.

The Beeches *(Fagus)* are very valuable trees for ornament, differing in their variety from other trees, being peculiar in their tendency of retaining their leaves during the winter; and, either green in leaf or browned by frost, form a picturesque family the year round.

The White, a native beech, is indigenous here on high or moist places, but rarely bears nuts as it does further north. The branches extend outward from the trunk in a horizontal position; the leaf, a light green, is graceful in its effect.

The English beech is more compact and of slower growth, is stronger in form and the foliage of deeper color, remaining on the trees during the winter and until the new leaf puts forth in the spring.

The Purple beech is so strikingly beautiful in the opening leaf that it is desirable in any grounds, and always an object of admiration. They prove to be long lived but will bear liberal dressing of manure, which has a marked effect in the color of the foliage.

If I ever coveted a tree, the property of another, it was the Purple beech; and I am not prepared, either for the lawn, or for a conspicuous position in any grounds, to assign the Purple beech a second place. It is said to have its origin in Germany. When properly grown, it has so many desirable characteristics that no grounds of any pretensions should be without it. I know of a tree where the lower branches extend fifty feet. In early spring, when the leaves are intensely purple, and when agitated by wind in strong sunlight, its brilliancy is unequalled by any of the tree family, and would vie successfully with any of the gorgeous tints of other trees in autumn.

The Fern-Leaved beech is the most charming and shapely of the beeches; with its leaf so artistically cut, and furnished in the greatest abundance, it makes a striking object of symmetry and beauty, and withstands the ice storms without injury; a

very pleasing tree to the cultivated eye, and sure to be marked in any collection as one of nature's best works in the beeches. Its growth is slow unless planted in good soil, when it makes a vigorous growth.

The American beech, found more or less over our northern regions, is much admired for its singularly neat and airy foliage, which often adheres to the branches during the winter. When in groups, they are delightful in their many excellent features; always in full foliage, as but few insects injure them.

The lindens (*Tilia*), once so popular, are now much less planted. The American, commonly called Bass, makes a stately tree, with a large leaf; and in July their flowers fill the air with delicate perfume.

The birches are an ornamental class of trees quite distinct in their habits of growth and foliage, prove well adapted to many situations and are charming in the landscape.

The Cut-Leaved birch is most esteemed and more largely used for planting. It makes a graceful tree of upright and partially weeping growth. The graceful sweep of its pendulous branches, with its beautifully cut and varnished leaf and with its snow-white bark, it must rank queen of the birches.

The Canoe birch about here is in its southern limit, and does not attain the same diameter of trunk that it does in more northern regions. I have watched the growth of one specimen for nearly forty years, until it is now almost two feet in diameter; its clear white papery bark giving a marked effect to the trunk, well furnished with branch and leaf. Where it flourishes, it is truly a picturesque tree, of spreading, graceful form, and its cultivation should be encouraged.

The Black or Sweet birch is the very first of the family that the boy learns to recognize, as he bites the fragrant bark. The tree has many fine features, and is beautiful in its golden racemes and airy leaf; it is deservedly finding its way from the wild to cultivated grounds, and thrives therein.

There has been recently introduced, I believe from England, the Purple birch. Both bark and leaf are intensely purple, promising to cope with the Purple beech. With purple tint and

glossy leaf it is conspicuous. My own is quite young, but of thrifty growth, and thirty-five feet in height.

The Magnolia.—A few of them thrive here and are among our most beautful trees. I have thirteen different kinds growing on my place. The Magnolia Acuminata grows perfectly well, is profusely clothed with large green leaves, and in June flowers; the fruit resembling a small cucumber.

The Magnolia Tripetala, after the first few seasons of growth, is found hardy, its beauty being in its very large tropical leaves, with large white flowers six or eight inches across.

Magnolia Soulangeana and Conspicua.—But few, if any, trees are more ornamental than these, when in bloom; being filled with white and pink flowers, four or five inches across, before the leaves unfold; they are particularly well adapted to small grounds.

The Tulip Tree *(Liriodendron tulipifera)*.—The tulip is a great favorite on extensive grounds, and being of rapid growth soon becomes a tall, stately tree, with leaves of peculiar cut and freshness. The flowers open late in June, are fine, tulip shape, of greenish yellow tint. I have seen trees near Philadelphia with trunks nearly four feet in diameter. They are, by the way, a difficult tree to transplant.

Then I admire the Gingko, or Salisburia, with all its foreign caste, its Oriental primness and precise regularity of growth and habit, with peculiar shell-like leaves of pea green, seemingly bearing the stamp of its native country, patient and polite.

The Larch *(Larix)* is considerably planted as an ornamental tree; its rapid and symmetrical growth soon gives shade and shelter.

The beautiful class of trees commonly known as coniferous evergreen, are indispensable in the landscape during the winter season. With the newer sorts of more recent introduction they are becoming great favorites with many planters. Their various shades of color during the year places them in the very front rank in ornamental planting.

The Pines, Spruces, Cedars, Firs, Arborvitæs are so well known that I will omit them to make room for some of the new

sorts: Picea Pungens, or Colorado Blue Spruce, growing at an altitude of eight to ten thousand feet above the sea level, is one of rare beauty; its silvery-blue color and well-furnished pyramidal form render it one of the most conspicuous and charming of the evergreens, the very Conifer of the storms.

The Concolor is from Colorado, and one of the finest and most graceful, and often as blue as the Pungens. It is slowly but surely taking a high rank in ornamental planting.

Nordmans Silver Fir, when well established, is an impressive evergreen, of strong, symmetrical habit, dark, massive foliage with lighter shade underneath.

The Douglas Spruce, Engelmanni, is indigenous in the Rocky mountains. Also we have from Japan a few sorts that are not only proving hardy but more pronounced in many ways than others. Abies Veitchii is one of the finest. Abies Alcockquiana is a magnificent tree of the greatest value. Picea Polita, a Japanese variety, with a pleasant shade of deep green, quite distinct. The Umbrella Pine, also from Japan, with long, leathery leaves and very compact, forms a very singular tree. Two fine specimens may be found at Elm park. It is too high priced for general use.

### FLOWERING SHRUBS AND PLANTS.

No grounds are complete without them. Each part of the shrubbery should have a distinct character of its own, which is easily done by grouping instead of mixing several sorts in one group. Large grounds may have combinations of groups, but plenty of space is indispensable for well-grown plants. The charm of a garden of hardy plants is complete only in the constant change in the season of bloom from spring until late autumn. Each week to find some new phase of floral beauty, and the expectation of what plants will be in bloom the following week, develops increasing interest through the season. It is well for small growers to commence with a few kinds most easily grown and add to them as interest develops from season to season.

Among the hardy flowering shrubs that are always satisfactory

may be mentioned the Deutzias, Spireas, Azalias, Rhododendrons, Berberis Thunbergii, Japan Quince, Weigelia, Exochorda Grandiflora, Forsythia, Hydrangea Paniculata, Syringa, Rosa Rugosa, and Hybrid Roses, the Lilacs, double and single, Viburnum plicatum, and Viburnum Tomentosum from Japan, the Laurel, upright and climbing Honeysuckles, Wisterias, &c. Among the hardy herbaceous plants are the Pæonies, with hundreds of distinct sorts, Irises, Lilies, perennial Poppies, Primroses, Anemones, Narcissi, Campanulas, Pyrethrums, Phloxes, and very many others, forming a succession of bloom from early to late. Color, fragrance and profusion of bloom may be had throughout the season as experience broadens the mind of the cultivator.

There are no grand or well-grounded rules which must be rigidly followed in planting. The due blending of colors should be well considered in planting both trees and flowering plants, with a view to the most pleasing effects. Indeed, there is scarcely an end to the simple or artistic combinations with which grounds may be adorned.

One of the chief phases of adornment of our grounds is to keep in close alliance with nature, with the unwritten law which governs and adorns each place unto itself, "as nature assisted by man"; which will invent and form those pleasing surroundings that men are delighted in; out of this develops a certain unconscious intelligence, as yet rarely taught in school or college, but emanates from hard thought, largely intuitive, which is born with a sense of beauty of form and harmony of arrangement.

The time is coming, even now is, when the value of every farm or homestead will be measured by the art and adornment of its surroundings; where men spend the most important years of their lives, there is an intrinsic value measured by the refining influence, especially to the young. The sanctity of the home is measured by its surroundings, without as well as within.

Ornamented grounds are yearly encroaching upon former neglected homesteads; tasteful dwellings are seen within plantings and groupings of coniferous and deciduous trees, with their

exquisite sheen, which gives them such attractiveness and quiet beauty. Roofs that shelter the manly and gentle virtues that are nurtured in refining homes, the intelligence and influence generated around these hearthstones, are the lineal descendants that contribute to the useful pursuits of life.

Home grounds and farm lands are only waiting in anticipation the finer charms of adornment which will mark their future, by the simple application of more educated tastes and rural aptitude are sure to bring forth, to quicken the fine instincts of civil life, with an array of good sense, and beautiful objects to behold in the landscape, which is beautified if in true accord with nature, and helps to adorn her. Wherever I see good tree-planting and well-kept grounds, I know they teach the value of rural life, that brings men into daily contact with nature, for every place must have its especial adornment, its own interpretation of the skill of the planter, and the amount of care bestowed, and those who cultivate best will be quite apt to get the most out of life.

I will close with the oft-repeated advice of the old Scotchman to his son: "Jack, Be planting a tree, it will be growing while you are sleeping."

## 13th January, A. D. 1898.

# ESSAY

BY

ROBERT FARQUHAR, Boston.

*Theme:—The Yellowstone Park, Oregon.*

Illustrated with Stereopticon Views.

Last season I devoted my vacation to a trip to Oregon and Yellowstone Park with a camera and notebook, the result of which I will try and give to you this afternoon.

The natural endowments of Oregon are apt to strike the easterner with amazement. He finds himself in a land of great forests, of lofty mountains, noble rivers and an atmosphere so clear that the Pacific ocean is visible at a distance of seventy miles. The soil of the valleys is remarkable in fertility, and although there are great extremes of temperature, fruits and vegetables attain an enormous size. The legislature has been particularly careful of the horticultural interests, and laws for the inspection of seed and imported plants have had the result that insects, troublesome in the east, are unknown there.

The raising of prunes is a recent industry, and promises well, ordinary soil yielding a uniform profit of $100 per acre. Fruits in great variety are raised in Oregon, and the display representing the State at the world's fair in Chicago was among the best exhibits of fruit seen at the big fair.

Seattle and Portland are the New York and Boston of the far west, and are destined before many years to become great centres of industry and population. In the great falls of the Willamette River, which washes the suburbs of Portland and falls into the Columbia, that city has the second largest single water power of

the country, Niagara alone excelling. The falls are capable of furnishing 75,000 horse power. Already large power works are constructed and furnish electric lighting and power service and drive the machinery of many mills and factories.

We climbed the steep sides of Mount Hood, the famous landmark which towers in the clear air fifty miles east of Portland, although it seems much nearer. The crater is quiescent, but not dead, for steam issues from the crevices of the rocks, and in places it is hot enough, though far above the snow line, to cook on the rocks.

Returning to the great river the party ascended in steamers and got a good insight into the vast salmon fisheries. Some of the big fishwheels net their owners as much as $30,000 each year by their catches. As the fish cannot make headway against the mighty current, the machines are built along the banks, where the stream turns the framework wheels armed with wire net flanges.

The fish, swimming into the nets, are carried up and thrown into a big pit, whence they are scooped out by machinery and loaded for transportation to the canneries. Last year 15,000,000 cans of salmon were shipped out of Oregon for consumption in all parts of the world. The fish are so plentiful that Indians with long poles armed with sharp hooks spear the fish and make $4 and even $5 a day by selling the fish at two cents a pound to the canneries.

The scenery along the Columbia cannot be excelled by any river scenery in the world. Its cliffs dwarf those of the Hudson and the Rhine, as the river rushes through great gorges of basaltic rock that have been worn into peculiar formations by the action of the torrent for ages. The great falls of the Columbia through the Cascade Mountain range are passed in canals and locks, and the smaller steamers are thus enabled to mount high up the big river.

The Indian associations of the Columbia are plentiful and interesting. The aborigines are long-lived, and it is not uncommon to see men and women who have passed the century mark. But their lodges and manner of life show no improvement from

contact with the whites. Rattlesnakes abound in Oregon, and the Indians of the old days used to inoculate pieces of flesh by getting the snakes to bite, and then they dipped their arrow points in the poison to give a death wound to their enemies.

The Indians of that locality buried their dead for generations on an island in the river, which is covered with a multitude of skeletons of bodies placed there on slight wooden platforms, which have fallen, leaving the place a wilderness of skulls, bones and battered sticks.

I would advise anybody going to the Yellowstone to carry materials for preserving flowers and grasses, of which the production of the famous region is luxuriant and greatly varied, from tropical growths of the hot midsummer to the little flowers that flourish only alongside the ice and snow. While visitors are not allowed to touch cultivated flowers, no interdict is placed on the wild flowers and handsome grasses, and a splendid collection may easily be obtained.

From the great fall of the Yellowstone River for twenty miles the cañon winds in and out between high walls so steep and lofty that from the bottom the stars can be seen at any part of the brightest day.

In the park is one of the most unique hothouses in the country. It is a strong wooden building constructed over a hot spring, and although in midwinter snow from fifteen to thirty feet deep buries the building from sight, the spring is perennial and keeps the temperature of the interior at summer heat, and the caretaker in the spring finds the lettuce and other crops ready for salad making, in spite of the snow on the roof.

20th January, A. D. 1898.

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# ESSAY

BY

PROF. L. F. KINNEY,

OF THE RHODE ISLAND AGRICULTURAL EXPERIMENT STATION.

*Theme:—Rural Economy.*

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SCIENCE consists largely in the collection and classification of facts. Viewed in this light it cannot be said that we have as yet a science of horticulture, although about fifty men in our country are studying the subject scientifically. We have proceeded in this study far enough, however, to be privileged to say something about rural economy. Civilization is the offspring of economy, and economy consists in the judicious expenditure of labor and capital. Consequently, real economy demands that the production of the necessaries of life shall be accomplished by the shortest and quickest methods. As an example, take the crop of winter lettuce, which is grown by a limited number of men, but it has reached a development in this country higher than anywhere else in the world. Lettuce grown in the field all winter is not much better than cabbage. Lettuce was grown that way probably by the early Romans. But there was no progress in lettuce raising until about the middle of this century. The plants simply lived in dormant condition in the earliest hothouses.

Cold frame lettuce was raised in the decade from 1850 to 1860, and by that time the market was well supplied and the improvements came to a standstill. Next the farmers put the lettuce into the hot frames in September, and got three crops

out of the year. Then from the hotbed to the hothouse was an advance that required more capital. The next step in the evolution was substitution of larger panes of glass and smaller supports, then hot water heating and last steam heating.

From the start the cost of production of lettuce has been decreased. You can buy lettuce in the markets at half what was charged fifteen years ago, still leaving a profit to the farmer. The result is that lettuce is no longer a luxury, but a common article of diet.

The culture of celery, a vegetable which was unknown until modern times, and was always grown in trenches until 1884. At that time the two self-blanching varieties — the "Paris Golden" and the "White Golden"—were introduced, and since with these varieties the blanching was done by boards instead of by the laboriously heaped trenches, the industry has received a great impetus. For a short time the retail price remained the same, and the pioneers in the new process grew rich; but now over-production has ensued, and only in the most favored localities is celery grown at a profit.

Grape-vines do not flourish well in Southern Rhode Island, while spinach does. That is one thing we ought to study more on our farms, for it is certain that particular crops flourish in certain localities and under certain climatic conditions.

They say a man who causes two blades of grass to grow where one grew before is a public benefactor, but I can't see it unless the raiser makes a profit thereby.

The peach, for instance, is peculiarly susceptible to conditions of environment. Application of this principle brings about prosperity.

Considering the building of roads, it may be that the labor of building a stone road may amount to more than the amount of labor set free by the completed road. So it seems to me, that the back districts should be encouraged to build the easier forms of road. It is a truth that more a road is used, the more easily it can be repaired.

About $1,000,000,000 worth of forest products are being consumed annually in the United States, and thus far there

is no systematic effort to conserve the supply. Is it not economy to use the roadsides to plant trees?

Trees should be planted along the roadside. They make the country attractive for pleasure seekers,—thus indirectly helping the farmer. It is not economy to use expensive machinery for small farms, which wears out by disuse and neglect in winter so rapidly that its utility in summer is not adequate compensation.

27th January, A. D. 1898.

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# ESSAY

BY

MISS HELEN A. BALL, WORCESTER, MASS.

*Theme:—Birds of the Farm and Garden.*

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I AM very glad indeed to hear that there is an interest in the Society in the study of birds. It seems to me that if a money value could be placed upon birds, as Mr. Kirkland has placed one upon the toad, that there would then be no question as to their being protected. I mean, of course, a money value upon the live bird, unfortunately the dead bird has a money value, but the dead bird or feather is very perishable property that rapidly depreciates, as when one has purchased a dead bird she cannot sell it at the end of the season for what she paid for it at the beginning. I think we only need to prove that the live bird is more valuable than the dead one to ensure its protection. In the case of the toad, very definite data was obtained by Mr. Kirkland from stomach examination, and upon that he bases his money value—from the number of cutworms alone that he destroys. He said that it was worth $19.88 to the gardener every season. We have not just the data to place a value upon each bird in just that way, but very definite examinations have been made by the Department of Agriculture, and so we have exact statements to make in regard to the value of the bird and the insects they destroy.

The Bluebird is placed at the top of the list by systematic ornithologists and is really one of the first birds in importance in its destruction of insects. Nearly three-fourths of its food is animal,—one-sixth of the food is of caterpillars, and one-fourth,

grasshoppers and crickets. The rest of the food is mainly of wild berries. There is no cultivated fruit at all on the list of this bird's food, and it is one of the most valuable. Fortunately, this last year it seems to have regained in numbers what it lost two or three years ago in the winter when he suffered so much from frost in the South, and the cold weather cut off the food supply there, and great numbers of them died from starvation. It is often worth while to know the vegetable foods and fruits that it lives upon so as to be able to plant them in order to attract birds. The Bluebird enjoys choke cherries, dogwood, bush cranberry, huckleberry, greenbrier, Virginia creeper, juniper, bitter-sweet, pokeberry, false spikenard, partridge berry, and the wild sarsaparilla.

The Robin is a very familiar bird of the gardens and orchards, and is accused of eating cultivated fruits to a large extent, but examinations show that less than five per cent. of his food is grown by man. Nearly one-half is animal, including wasps, ants, bugs, spiders, angleworms, and a large per cent. of grasshoppers and crickets and caterpillars. He also eats great numbers of March fly larvæ, so preventing injury to the hay crops. He has been supposed to feed largely on angleworms from his well known habit of running over the grass, but we find that the angleworm forms a small per cent. He picks up a number of cutworms and an army of insects that lie in the larvæ state in the ground. Professor Forbes has asked the question: "Will the destruction of seventeen quarts of average caterpillars, including at least eight quarts of cutworms, pay for twenty-four quarts of cherries, blackberries, currants and grapes?" and someone else makes the statement that "He is a poor business man who pays $10 for what he knows must later be sold for fifteen cents or less." Yet I have known of instances where a robin that had saved from ten to fifteen bushels of apples that were worth a dollar a bushel, by clearing the trees from canker worms in the spring, was shot when he picked one of the apples that he had saved for the ungrateful owner. The Robin is fond of wild fruits, and these may be planted to draw his attention from the garden fruit—dogwood and wild

grape, wild black cherry, choke-cherry, mulberry, cranberry, blueberry, huckleberry, hollyberry, elderberry, hackberry, service-berry, spice berry, hawthorn, bittersweet, Virginia creeper, mountain ash, barberry, pokeberry, strawberry, bush-berry, juniper, and bayberry.

The two Thrushes that we have here through the summer, that is, the Wood Thrush and the Wilson Thrush, are almost wholly insectivorous. They feed to some extent upon wild fruit and do not come so close to the orchards as the other birds, but still they are never far from the habitations of man. The Thrushes here come every year by Millstone Hill, and Green Hill, and I know that they are in the south part of the city and also in the west. I found a pair of them at Elm Park one spring. The shrubbery has all been cut away just where I found them. It is very unfortunate to lose the lower branches of the trees and the thick shrubbery where the birds go for food. They seek those places especially for protection and need them to resort to. They do a great deal of good in eating the larvæ of a great many insects.

The little Kinglets are very valuable. They are the gleaners of trees especially, and we usually see them about the trunk and the limbs of the trees, pecking in all the crevices of the bark. They are very industrious indeed. The Golden-crowned Kinglet is a winter bird and is here all through the winter, and the Ruby-crowned comes in the fall and the early spring. The Ruby-crowned has a wonderful song for so tiny a bird. It is one of the most wonderful things to find such a volume of song coming from such a scrap of a bird.

The white-breasted Nuthatch is quite common here and is a resident, that is, lives here the year round. It is distinguished from the Woodpecker by having almost no tail. The wings come down even with the tail. Its habits are quite different from those of the Woodpecker, and it is almost always coming down the tree or hanging from the inside of the branches. The small one of Canada comes to us in the winter and last winter was very abundant indeed. It was found in large numbers by the Lake, and in the western part of the city. The winter

birds are apt to be variable in coming to us. The white-breasted Nuthatch gets its name from its well known habit of fastening a nut into a part of the tree and hammering it with his bill to break it, in order to get the grub of the insect inside rather than for simply food itself.

The Catbird is a common bird of the garden, and is often looked upon as an unwelcome visitor because he enjoys fruit. Experiments have shown that he prefers mulberries to strawberries and cherries, hence, if Russian mulberries are planted in henyards or pig-pens, the hens and pigs will not only be provided with excellent food, but the Catbird will be attracted thither, in this manner protecting the more valuable fruits. The Catbird arrives about the first of May, and during that month he does valuable service. Ants form eight per cent. of his food; thousand-legs, ten per cent.; May beetles, eight per cent.; ground beetles, eight per cent.; caterpillars, eight per cent. Through June about the same proportion is maintained of animal and vegetable food. As soon as mulberries, raspberries, cherries and strawberries ripen, the birds naturally forsake the dried fruits, that is, those that have dried through the winter. About this time in May one-third of its food is gleaned from berries of the previous summer,—sumach, smilax, and other fruits that have been hanging all winter. As soon as grasshoppers come, grasshoppers and crickets form a large proportion of the food, for ten per cent. of all the food taken during the latter part of June is of grasshoppers and crickets. During the first twenty days of July, the Catbird is believed to take the maximum of cultivated fruit. Raspberries and blackberries are the favorites, but by the middle of August these give way somewhat to black wild cherry, dogwood, and elderberry. The Catbird's food consists of three per cent. of carniverous wasps and wild bees that carry pollen from flower to flower, but this is counterbalanced by the destruction of weevils, thousand-legs, and plant-eating bugs. Catbirds have a liking for the easily obtainable predaceous ground beetles which are supposed to be beneficial to the farmer, but the loss of these insects is made up for by the destruction of beetles related to the May bee-

tles. The Catbird subsists largely on fruit of which about one-third is taken from cultivated crops. It eats caterpillars, grasshoppers, and crickets, with a small percentage of leaf-eating and click beetles. The volume of these insects destroyed is equal to only one half of that of the cultivated fruit eaten.

The Brown Thrasher, which is a close relative of the Catbird, is certainly more valuable, as the results of investigations show, as to the fruit it destroys and the injurious insects. The quantity of food taken from cultivated crops amounts to only eleven per cent., eight per cent. of which is fruit and the rest grain. The farmer is more than compensated for this loss by the destruction of an equal bulk of May beetles which if allowed to live would have done much more harm than the Thrasher, and left a numerous progeny for next year. Grasshoppers, crickets, weevils, click and leaf beetles form a large proportion of the food. It destroys twice as many caterpillars as the Catbird. The Brown Thrasher has a fine soft note, especially contrasted with that of the Wood Thrush in the ecstacy with which he pours it forth. The Brown Thrasher is often called the Brown Thrush, but it is not a Thrush properly. The Brown Thrasher and the Catbird belong to the Mocking-bird family. They are certainly characterized by the song that differs very much from the strain of the Thrush. Thoreau speaks of the Wood Thrush as having a song of fine modulation. He gives vent to a beautiful strain, and then pauses in order to enjoy it himself perhaps, while the Thrasher pours forth a perfect volume of ecstatic song, and then at the end of the nesting season, a very brief period of song, he seems particularly depressed in spirit and skulks away and hides among the bushes.

We have a large number of little Warblers that are wholly insectivorous, and do a great deal of good in the orchards, in picking up the tiny insects that infest the buds and plants, the flower buds on fruit trees and all the cultivated plants. These Warblers are called the Myrtle Warblers, and have three or four distinct spots of yellow. They are migrants, coming to us in the spring and in the fall, and last fall I found a large flock of them. We have a large number of them beautifully colored.

They have not so fine a song as many of the other birds, but it is very sweet. The Wild Canary, the Redstart, the Black-throated Blue, and the Oven bird that is very familiar from its call, all these are very valuable, simply from the number of tiny insects they destroy.

The Vireos are common. This is the Red-eye that is common in all of the shady trees in the city streets, and so common throughout the country everywhere. It is often called the "Bird of the Maples" because he seems to prefer that tree to any of the other hardwood trees. They build their nests in the bark of the branches, and they usually use some newspaper for this purpose. Birch bark is used in some cases, but they are quite sure to use a bit of newspaper. Vireos rank next to the Cuckoo in the destruction of caterpillars, and they are of great value from their fondness for bugs, weevils, May beetles, inch-worms, and the leaf-eating beetles. There are three or four varieties that are known here. This is the Yellow-throated that is almost as common as the Red-eye. It has a song very closely resembling that of the Red-eye. We might say that the Red-eye's song is inspiring and the Yellow-throated's loud in quality, but they are very similar indeed. There are also the Blue-headed or Solitary Vireo and the Warbling. The Warbling is very common indeed in elm trees.

This is a bird that visits us in winter, coming north late in the fall and staying until the first of April. The Shrike, or Butcher bird has rather a bad reputation, because he kills small birds by paling them on the thorns of thorn bushes. It is not known exactly for what reason he does this, as he does not seem to return to them. The thorn bush is often spoken of as the "Shrike's Larder." The Shrike does a great deal of good in catching mice and also in catching English Sparrows and disastrous caterpillars, also some other noxious insects. It has really a sweet song, a sweet note, and is said to imitate the song of a number of birds for the purpose of attracting them and getting close enough to catch them.

There are the sweet and beautiful Cedar birds, or Cedar Waxwings—Waxwings from the bit of red at the tip of the wing

feathers, which looks like a bit of sealing wax. This is only apparent in the mature birds. It does not come in the first year. The Cedar birds are also called Cherry birds, and they are looked upon with great disfavor because they come in cherry time. They are said to eat a great many cherries and so are shot, but their food is largely animal. Out of one hundred and fifty stomachs that were examined only nine had any traces of cherries, and the food is as a whole entirely of noxious insects, caterpillars, grasshoppers, spiders, and the elm leaf beetle; it is particularly valuable in destroying that beetle. Mrs. Mary True speaks of one village where the elm trees had suffered to a great extent from the ravages of the elm leaf beetle, and after a time a flock of Cedar birds came and destroyed the beetles, so that the trees quite recovered; and someone makes the calculation that twenty Cedar birds would destroy nine thousand worms during the season when the cutworm is exposed. They do a great deal of good in destroying noxious insects.

The Scarlet Tanager also is a very valuable bird. It is a summer resident, and is very well known. Perhaps the female is not so well known as the male. It shows clearly the protective coloring given the female. When the male is especially bright, it always follows that the female is sure to be very dull in color. If the females were colored like the males and they were to build a nest and sit upon the eggs, the nest would be quickly discovered by hawks above and man and boy below. The Tanager is useful in destroying a great many weevils, wireworms, and the gipsy moth.

The winter Grosbeak is one that comes occasionally. We are not sure of it every winter, as the winter migrants are much more uncertain than the summer ones. We can always know to a day when the summer birds will come to us, but it seems of great uncertainty when the winter birds will come to us. The Pine Grosbeak is very fond of wild berries. Those that were here two or three years ago were feeding upon the mountain-ash berry, and the seeds of the maple, elm, and ash. They are beautifully colored, and have a sweet rather plaintive note. The summer Grosbeak, the Rose-breasted Grosbeak, is particu-

larly valuable because he is fond of potato beetles. He also eats the gipsy moth, and a great many other noxious insects, and also grasshoppers and crickets. This bird comes from the middle to the last of April and spends the summer. He has a fine song, a song that is perhaps next to that of the Wood Thrush in the beauty of its strains. This is quite abundant about Green Hill and Millstone Hill.

The Sparrow family is a large one, that is, the Sparrow family, I should say, including these Grosbeaks and all birds with strong beaks that can feed upon ground beetles and upon seeds and nuts. They do not seem to be so valuable perhaps in destroying insects, though they feed their young upon insects and so consume a great number in that way, but they are very valuable in destroying the seeds of noxious weeds. The Savanna Sparrow, a bird that is distinguished by a pale yellow line over the eye, is very much like the Song Sparrow otherwise, in its coloring. It comes early, about the last of March, and is a summer resident, though I think it is not so well known as the other Sparrows. The Song Sparrow, of course, is the best known of them all, as it comes very early, sometimes in February, and is here until late in the fall, occasionally perhaps wintering. It builds its nest upon the ground, and the song is one of the sweetest notes of all the springtime and the middle of the summer. It has a very varied song, and it is hardly possible to describe it, to say definitely, as I often hear it said, that he begins with three opening notes, a trill, and three high notes at the end. I have heard it begin with three notes and four, and with simply an upward slur. The song is very much indeed like that of the Vesper Sparrow, and its color is very much like it only it has white lateral tail feathers. The White-throated Sparrow is here only in the spring and in the fall. It is a migrant, going farther north into the White Mountains and Maine to nest. It has a fine song, one of the most beautiful perhaps of the Sparrow family, clear, long, high notes, followed by trills rapidly given and very sweet. Its note gives it the name "Peabody Bird," from the four words that can be said with it, "Old man Peabody, Peabody, Peabody." It is really

very abundant. I found it in very suprising numbers in the city in the fall, scratching about under shrubbery, where it finds its food.

The Junco birds come to us in the fall and stay through into the spring. They are often called the Black Snow bird or Slate-colored Snow bird, but they are not Snow birds properly, that is, they are not the Snow Flakes or Buntings that come to us from Greenland in the winter. These go farther north into the Provinces and Maine to nest, but not so far north as the Snow Bunting. Junco is a very good name because they feed upon seeds and weeds and grass. As they fly they show white lateral tail feathers and are easily distinguished by those. They are usually in flocks and fly up as anyone approaches, showing these tail feathers.

The Fox Sparrow is the largest of the Sparrow family, and comes very early in March, and then again very late in October, November, and sometimes in December. It goes far north to Labrador and west into the Middle States to nest. It has a fine song, fuller and more ringing than that of the Song Sparrow, and is quite differently colored. The Fox Sparrow has the reddish color of the fox as no other Sparrow has.

The Chewink is another Sparrow that is a very common summer resident. It comes about the time the Catbird does, and is very common along stone walls wherever there is thick shrubbery to go under. It is a ground bird, having strong feet, and is often called the "Ground Robin." It has three colors, black, red and white. It has a very pleasant song, and the common note gives it the name of "Towhee," and it is often called the "Towhee Bunting." Its note is heard very often in huckleberry pastures. It is also called "Chewink," a name corresponding to the trill.

The Indigo bird is still another sparrow that last spring I found very common indeed over near Stone Hill. The female is colored very differently from the male in this case. They are ground birds in the sense that they keep very close to the ground, as really so many birds do. Naturally they feed and nest within a few feet of the ground.

The Bobolink of the North visits us in the summer. The female is a brown bird and the male is of the same color in the winter, so that the people of the South call them the Rice birds. As the females are in great excess of the males the southern people think it is perfectly right to eat so many of them. The Bobolink changes his plumage as he comes north in the spring, and is a very different bird in appearance from the Reed bird of the west and the Rice bird of the South that is so troublesome in the colonies. Here where it nests it is really very valuable and does a great deal of good work eating the insects that are found on the ground and in the trees. He is certainly valuable here for his fine song. Thoreau says, "As he flies over the meadow it is all bespattered with melody." He sings finely. A song on the wing is far more wonderful than one in the top of a tree.

The Bobolink begins the Blackbird family, and the Meadow Lark is also a Blackbird, though its color does not suggest that, but the bill and other points have proved it to be a Blackbird. It is a brown bird, a terrestrial bird, having strong feet for walking over the grassy fields. The Meadow Lark is perhaps a good name because he is distinctly a meadow bird, although it is found as much on the hills especially where there are strips of grassy fields as on Newton Hill. It builds its nest in the grass, often making a little arched covered way to approach it. The Meadow Lark is one of the most valuable of the birds in the food it eats. He has been accused of eating clover seed, but ninety-nine per cent. of the food taken in clover time is found to be mainly of grasshoppers. It is estimated that the value of the grass crop, saved by the Meadow larks, on a township of thirty-six square miles, each month during the grasshopper season is about $24.00. It also eats May beetles, ants, bugs, caterpillars, curculios and leaf beetles. So we see that far from being injurious in any way, it is one of the most useful allies to agriculture, standing almost without a peer as a destroyer of noxious insects. The bird comes very early in March, and it is quite easy to be seen then although the color does harmonize so well with the background that at first it is quite difficult to find the bird, but when you have once heard one singing it is

easy afterwards. He walks about very leisurely in the grass. The flight is peculiar, a very beautiful hovering flight, a little soaring like the hawk perhaps, and as it flies it shows two very distinct white tail feathers. Then it has a fine song, it is a rather piercing note perhaps and in a manner strained, but it is one of the sweet notes of the springtime.

The two Orioles, the Orchard and the Baltimore, are very valuable. Both have an undisputed reputation as destroyers of insects. They eat about equally perhaps great numbers of caterpillars, the tent caterpillar among others, and bugs, grasshoppers and beetles that feed upon the locust and the apple trees. Then the Baltimore eats the wire-worm and the larvæ of the elaters. They are vegetable feeders and live upon the roots of grass, wheat, corn, potatoes and garden vegetables. Generally their eggs are laid in pastures and on the ground where the surface is undisturbed or in the vicinity of rotten wood. The wire-worms are very hard to kill, so that we should be most grateful to the birds that destroy them. The Oriole is a favorite of poets and people in general. A story is told that Lord Baltimore—the first Lord Baltimore, George Calvert—was so pleased and cheered by the presence of the large number of these birds in the trees of Maryland, that he adopted their colors, the black and yellow of the Oriole.

The Crow Blackbird or the Purple Grackle is very common here. The Purple Grackle has a purple irridescence all over the plumage, while with this variety that we have here, the colored purple irridescence comes off quite early and the rest of the plumage has a brown slatish appearance. These are common birds in pine trees, and we often find them walking about on the ground. In the West they are very troublesome, going there as they do in great flocks of thousands. There they do a great deal of damage to the grain crops, but we have no such trouble from them here and they often follow the plough over the fields and afterward when their stomachs are examined they are found to be crammed with the grubs which they have picked up. Then they eat a great many destructive insects—the rose beetle, May beetle, grasshoppers, caterpillars, crickets, and locusts.

The Blue Jay has a somewhat bad reputation, like the Crow he is accused of pulling corn and eating small birds, but, however, out of 280 stomachs examined the remains of birds' eggs were found in only three and of birds in two. 17 per cent. of the food of the year was found to be corn, but 22 per cent. was found to be of insects, such as grasshoppers and caterpillars; so the verdict would seem to be in his favor rather than against him. He is very fond of the nuts of the oak, beech, and other fruits of the woods, and as this is just at the time when corn is most plenty, so that it would show that if he could get the fruit he likes, he would not touch the corn, and it is very certain that they destroy very few birds or birds' eggs, and the same is true of the crow. A very bulky pamphlet on the crow has just been issued by the Department of Agriculture, showing how much good the crows really do and how well they deserve protection instead of being shot for their depredations.

The Fly Catchers are very numerous and do a great deal of good. They are almost wholly insectivorous. The Phoebe is very common through the summer season. It is often called the Bridge bird from his habit of building his nest under bridges and over streams. The four Fly Catchers that are very common here are the King bird, the Phoebe, the Wood Peewee, and the Least Fly Catcher, a tiny little bird that is very common in our orchards. These have a peculiar flight, always starting from a perch where they keep a sharp lookout, making a sudden circle and coming back to the point from which they started. The Phoebe lives mainly on animal food, and weevils that are so injurious to beans and wheat, flies, May beetles, caterpillars, squash beetles, elm leaf beetles, and grasshoppers. There are so many weevils, between eight and ten thousand species, that every bird that eats weevils should be carefully protected.

The Chimney Swift is very familiar. It is often called the Chimney Swallow, but it is not properly a swallow at all, its nearest relatives being the Humming-bird and the Whip-poor-will and the Night Hawk. They are birds of very strong powers of flight, and swoop through the air, taking all the insects that they find. The Swallows, properly speaking, the White-breasted

that is so common, and the Barn Swallow, are very valuable indeed, not only as fly catchers but as catchers of flying ants and a number of moths.

The Woodpeckers are very valuable in gleaning from the trees the grubs and larvæ of a great many insects. The Flicker is a very common bird of summer. It has a great many different names—it is the Golden-winged Woodpecker, and the Flicker, and it is known by a number of other names. It is perhaps almost as much a ground bird as it is a tree bird, for it is very frequently found feeding on the ground, and 50 per cent. of its food is of ants—three thousand were found in one stomach. The Downy and Hairy are two small Woodpeckers. The Downy is the smallest of all and is very common all the year round in the shady trees of the city streets. The Hairy is marked exactly like the Downy but is a few sizes larger—the Hairy is about the size of the Robin—and not one of these three Woodpeckers shows a questionable trait. They are all very valuable and should be protected and encouraged in every way. The yellow-bellied Woodpecker, that is known as the Sap Sucker, perhaps does a little damage to the trees as it bores so many holes and strips off the bark, but it does a great deal of good in destroying insects, it seems sufficient good to balance the harm it does.

The Black-billed Cuckoo is very valuable indeed as it eats so many caterpillars, grasshoppers and spiders and also potato beetles. This is the bird that is often known as the Rain Crow because it is supposed to give a call or note just before rain. But I think that hardly holds good. He sings at all times of the day and in all kinds of weather. The note is a little peculiar, it sounds more like "Kuk-out" than "Cuckoo". It is a shy bird and is often found feeding upon nests of caterpillars. This bird has none of the traits of the European Cuckoo at all. It builds a shabby nest it is true, but it builds its own nest, and cares for its young.

The Hawks and Owls are looked upon as birds of prey, and are usually considered perhaps as doing much more damage than good, if they do any good at all, but the Owl, and especially the little Screech Owl, is very valuable, and it is very sad indeed to

see its head upon a hat. Nearly three-fourths of its food is of injurious mammals, together with grasshoppers, crickets, and rats, mice, chipmucks, cut-worms, and small reptiles. He also devours night-flying beetles, and no other Owl, except the Burrowing Owl, destroys so many noxious insects. It is one of the most nocturnal of our species, choosing dark cavities in hollow trees during the day. This little Owl does not migrate or even wander far from its habitation during the winter months. It is known to be an expert fisherman, one hole was found to contain sixteen horned pouts that the Owl had caught through a hole in the ice. It was a mile from the hole in the ice to the hole in the tree where it stayed during the winter. They often go about the city and do good work in destroying English Sparrows as well as mice.

The different species of the Hawk should be carefully discriminated. There are three that are injurious, as they attack poultry to a large extent, and perhaps do more damage in eating poultry than in destroying mice and small reptiles—they are the Sharp-shinned, the little Hawk that flies through the trees so swiftly, Cooper's Hawk, and the Goshawk. The Red-shouldered, the Red-tailed, the Broad-winged, and the Rough-legged are very valuable. The Red-shouldered and the Red-tailed are often called Hen Hawks and are shot at mercilessly, but they destroy a great many of the smaller rodents that do so much harm. They kill mice, rabbits, frogs, snakes, half-grown squirrels. The Broad-winged hawk is especially useful as it flies in the dusk and destroys great numbers of the larvæ of the larger moths that smaller birds either cannot take care of or do not care for. The Rough-legged hawk comes to us in the winter and always keeps just south of the snow line, and is valuable in destroying mice.

We have just one bird that seems not to be valuable in any respect, that is the English Sparrow. A pamphlet has just been published in England showing investigations that have been made there. Investigations had been begun there, but were abandoned shortly before it was introduced into this country. It seems very unfortunate that the matter should not have been

more carefully investigated before it was imported. On one estate in England, the sparrows had been destroyed regularly and the gardens and orchards there seemed directly to flourish very much better. The insectivorous birds being protected do their work fully and do it very much better. The English sparrow is very pugnacious and drives off the other birds. It is found not to be insectivorous. The result of stomach examination shows this very fully. He eats grain, and is known to be graminivorous almost wholly, and so, in a way, destructive. But in places where the English Sparrow has been driven away, that is, systematically killed off, as it has been at Green Hill, our native birds do their work finely. I do not know whether there is any other place near here where they are driven away, but they are not allowed at Green Hill, and that is one of the best places in Worcester to find our native birds. Our native birds are so valuable economically and aesthetically that certainly they deserve complete protection, and in order to protect them it seems that a great deal might be done in planting native shrubs. Unfortunately, the New Englander in his zeal to have everything trim cuts down the underbrush and that is just what the birds need. An ideal farm would have all the native shrubs, the berry-bearing shrubs, along stone walls with all the natural undergrowth, and this too along the roadsides. This is so persistently cleaned out that the birds do not have the opportunity to do their best work, because the larvæ of so many insects takes that form either on or in the ground and the birds must work about the ground in order to pick them up. So if we can only have this shrubbery,—the hackberry, that is so productive to birds, the pokeberry, a great many birds enjoy that and it is really a beautiful shrub with wonderful color in its branches, and if it only came from foreign parts would be greatly prized, viburnum, the dogwood, bittersweet, and a great many other of the native shrubs,—and far fewer English Sparrows, I am sure the birds would do a great deal of work that has to be done now by hand in order to get rid of the noxious insects.

3d February, A. D. 1898.

# ESSAY

BY

ARTHUR J. MARBLE, Worcester, Mass.

*Theme:—Pear Culture.*

*Mr. President, Ladies and Gentlemen:*—I was in hopes that something might be said today on the cultivation of pears that would be of benefit to some of our Society, but when I look upon those who are assembled here before me, and see the venerable and gray heads, I feel that there can be more said perhaps in the audience in the way of instruction in pear culture than can be said from the speaker's table. It might be asked why we should stop at the present time to consider this question of pear culture. Those of you who attend our exhibitions have noticed perhaps that in some of the more popular varieties there are exhibited from thirty to forty, and sometimes from forty to fifty plates. The first in the order of merit and rank of the first ten of these plates are usually very fine specimens, and as has been said by one exhibitor, "And when you go beyond that, the majority of the plates are useful to us only as an object lesson of what we ought not to raise, and if any prize at all were to be awarded, it would be what is sometimes called the booby prize." Again, the difference between the fine specimens of fruit which are exhibited here and what you so often see heaped upon the fruit-stands and in the market is very marked. You and I, at least I, frequently when standing in the hall, have heard people say, "Well, why don't we find such fruit as that in the market? Why do we not see it on the fruit-stands?" This goes to show that there is a difference, and a great difference, in fruit culture

and especially in the culture of pears, the particular object of our talk today.

To succeed in pear culture, I think you will agree with me, one should have a natural taste for it. He should think more of the tree than of what grows on it. He should be more interested in trimming and thinning the flower and fruit than he should in eating the fruit after it is matured; and in addition to this, if he comes of an ancestry of similar tastes, so much the better. In my case, my earliest boyhood recollection of my father, who was even then a member, and an interested member, of this Society, was seeing him with his hired man selecting, sorting, and setting out his pear trees; and I can remember even then that the names of Samuel H. Colton, John Milton Earle, D. Waldo Lincoln, Jaques and others, were household words. What they said about this pear, and what they said about that pear and that tree was authority to be launched at anyone who dared to doubt or differ. On this home-place nearly or quite one hundred varieties of pears were grown, which, as a boy, I had full freedom to range, cull, and sample, and educate my taste for future life.

In cultivating pears, I think the first point that we have to consider is that of soil. Now there are those who hold that the only soil to raise pears on is heavy black clay soil. Downing, our authority on fruit, says a rich, mellow loam, but does not qualify that by saying whether his loam is clayey or sandy; but I know when I began my last cultivation of pears, which was in this city, that my soil ranged from sand to gravel, and some of the gravel was pretty coarse, and a pear expert claimed that while I might be able to get some pears that would do to eat in my family, I never would be able to produce them in any number which would be fit to exhibit in competition in the halls of this Society. To those who have soil of that nature, sandy or gravelly loam, I would say they need not be discouraged, and that with intelligent cultivation and plenty of fertilization, that soil can be made to produce and compete with any soil, not only so far as looks and appearance is concerned, but I do believe, Ladies and Gentlemen, that the flavor of all fruits and

vegetables that are grown on a sandy loam is vastly superior to that which is grown on clay soil. And I think this early experience about which I speak was on a black clay soil, which was capable of raising two tons of hay to the acre, and the pear trees grew very thrifty, but the flavor of the fruit was not such as we get on a sandy soil. Therefore, I would suggest, as one point in my opinion in pear culture, that to develop and bring out the finest quality and flavor of the fruit a warm sandy loam, well fertilized, is the proper soil to have. Those who already possess that soil need not be discouraged, but may feel that they have about the right thing. I do not know but that it would be evidence in that regard, that from that soil during the year of 1897, I succeeded in this hall in getting the first premium on the Bartlett and the Bosc, and on the Anjou and the Seckel the second premium, which shows at least that the soil is not to blame if we do not succeed.

Having selected your soil, the next thing to do is to prepare it by thorough and deep cultivation, with plenty of fertilizers. After you have put in what seems to you a great plenty of fertilizer, put in just as much more, for the pear tree is very hearty and a gross feeder. I do not know of anything that will stand as much and as rank fertilizer as the pear tree. I never saw a soil yet that was too rich for the pear tree, if it was properly drained and kept in cultivation.

Having selected and prepared your soil, you want to make up you mind what varieties to set out. Downing, our authority, the official authority of the Society, names nearly three thousand varieties, I think, in his last edition, which was in the latter part of the eighties. There are a great many more varieties which Downing has not mentioned. We may say that out of something over three thousand varieties of Belgian, French, American, English and Russian, there are, roughly speaking, about twenty varieties which are fit to grow, so our President and I think, and we care to grow only ten. It would be well for the novice in pear culture to ascertain what the standard and selected varieties are, because our tree agents who travel around are generally blest with more ability to sell than they are to tell

whether what they have to sell is the right thing for the buyer. Their ambition is to make sales, and I have sometimes had them come and recommend to me trees and varieties which I know are not worthy of our attention. Of course, it may be said that tastes vary, and some pears which our President and other members of our Society and I might not include in our list would in the difference of taste seem very desirable to other people. But when I speak of varieties that are desirable to grow, I am speaking in the popular sense, those that will appeal to the majority of people. I know that I have at least one or two that I am pleased to grow myself as a sort of individual recreation and pleasure, just as another has some varieties that he loves to grow which everybody does not care to grow and which it would not be profitable for everybody to grow.

Having selected your trees, the next question is to set them out properly. Now there is quite a difference in the setting out of a tree; some people cannot set out a tree in April and have it live, while others can set one out in January and make it grow and thrive. Do not dig a small hole as if you were about to set out a fence post. Of course, I am assuming now that your land has been ploughed, and ploughed deeply and thoroughly, and well fertilized. In digging your hole to set up your tree, do not dig a small hole, but dig a hole that is two or three times as large as seems necessary. And I might say here, that my remarks to-day are not so much for the professional fruit raiser as for the amateur who desires to cultivate for his own pleasure and to exhibit. Having dug the hole, take the tree, and setting it in the hole, spread the roots around very carefully. I think it is a good idea to turn what you have taken out of the hole upside down and put that which was at the bottom on top, which with proper care and fertilization will become as good as that which was formerly on top. There is one other point which I would mention, and that is that the trees may come to you properly headed in and trimmed; but if they are not, you want to be sure to cut off from the head of the tree as much as, or a little more than, was lost in the roots. Always the roots will lose more or less, and it is necessary that a balance should

be maintained with a little in favor of the roots after it has been transplanted.

Speaking of setting out a tree in January, eight years ago last month at the south end of Main Street at the corner of Beaver, they were excavating the cellar for what is now known as the Beaver Block. It was about the first week in January, at least not later than the tenth, and was what you would call an open winter. On the land stood a very thrifty pear tree which was about ten or twelve feet high. It was a nice looking tree; and I said to the man who had charge of the excavation that when he got to the tree I desired him to take it out with what care he could, striking off as little of the roots as possible, and leave it at my place. He did so, and finding it there I took care of it that night and the next morning proceeded to prepare a place for it. I took off two-thirds of that tree and I set it with considerable care, and after that I gave it a vigorous pruning. I never saw a tree which was set out in the spring or fall that did better than that tree set out in January, and the tree was a Rostiezer. I believe that I have had the pleasure of getting the first premium for the Rostiezer from a tree set out in the month of January. I do not know whether this has been accomplished very often or not, but I would not like to set out a pear tree in January this year.

One method of getting extra fine fruit I have found very successful and that is what we call double-working a tree, so much so that I have got where I do not care to raise pears in any other way. I presume most of you understand what double-working is, but there may be some here who do not know what the term means, and for their benefit I will explain. The singled-worked tree is where the standard stock is budded and those are quite small, and when they get to be about seven, eight, nine or ten years old, according to the variety, they get into bearing condition. Now, to double-work a tree is to take a tree when it has attained a size sufficient, and that is generally the time when it will come into bearing, and cut off those limbs and graft on the scions of the variety that is desired, and my experience has been, both in the clay soil of my boyhood and

on the sandy soil which I have used in my maturer years, that in no other way can we get such fine pears, quality and quantity both considered, as we do in double-working.

In the early fifties, when Mr. Hadwen was a young man and I was a boy, there was a pear which I think you will agree with me in saying was one of the finest pears we have ever had, and that was the Flemish Beauty. A disease called the pear crack attacked it and it became for a long time and perhaps forever, with here and there an exceptional case, valueless; that is to say, the pear cracked up to that extent that they were good for nothing but to feed to the stock, but we do not raise pears for that purpose but rather for dessert. Now we have found that the Flemish Beauty is one of our most valuable trees for double-working. It is a fact that it will produce, so far as my observation and experience go, better pears than budded trees or single-worked trees. Particularly is this true in the case of the Bosc which is, perhaps, next to the Bartlett, our most popular pear. Now the Bosc, budded or single-worked, is a tree of very slow growth. It takes a long time to grow the Bosc on the standard stock and when you get the tree the results are such that many people get discouraged and give up trying to grow it. But take the Flemish Beauty of a size that can be properly handled, and another good stock is the old Vicar and another is the Bousock,—pears that we used to grow forty years ago, but which are very little grown now,—and they make excellent stock for double-working, especially for the Bosc. Some of the finest specimens I have ever seen came from the Vicar and the Flemish Beauty.

On the same soil, within five rods of each other, I set out a very handsome Bartlett tree, a tree that was sold to me by a nurseryman as one that would come into immediate bearing, and a Flemish Beauty that was grafted with the Bartlett. Those two trees I have had about ten years, and I have come to this conclusion, that the Bartlett which was single-worked was no good as a Bartlett. On the contrary, the Flemish Beauty which was grafted with the Bartlett produced very handsome Bartlett pears with a very fine flavor. I think you will agree with me

in deciding in favor of the Bartlett that was grafted on to the Flemish Beauty. I have grafted the Bartlett over and am trying to make a Comice of it, and I never saw any Comice that was single-worked or budded that compared with the growth of the Comice which I am getting on this Bartlett tree. Perhaps I am very near solving the question of how to raise good Comice. I think it is a matter of considerable interest, for the Comice is one of the finest pears that we have, and if we can only get them by double-working them on the Bartlett, it is going to be a thing of great value. It is denied by many that the stock into which the graft, the scion, is set, has an influence on the graft and on the fruit we get from the scion. It may be that those who take this position are right. But this is my experience. About four rods apart in one direction, and two rods in another direction, I have three trees, and all three are grafted with the Bosc. Two of these trees are the Flemish Beauty and the third one is a Bousock. On the Flemish Beauty trees the russet of the Bosc gives the pear a golden and pink tinge, and in some cases it is almost as pink as the pink of the Flemish Beauty; while the Bosc on the Bousock is green, a very dark green, and does not average as large as those on the Beauty. It is a little singular that we should have such a coincidence. I would say that otherwise the trees have stood a fair showing. They were vigorous and thrifty and had the same care and cultivation, and all stood in a sunny situation. Of course, if one of those trees had been on the north side of the barn, in the shade, that might explain the light and dark color, but the conditions were equal except the difference in the stock.

In pear culture, I believe that we ought to look for quality rather than quantity. Now, I have plenty of neighbors who go out and put up all kinds of poles, sticks, ropes, and chains, to hold up their pear trees when they are laden down with pears, but I have one invariable rule, — never to allow a limb of a pear tree to carry any more pears than it can hold of its own strength. Instead of propping or tying, pick them off. People say, "We cannot do it; we cannot waste those pears." Why, they are worse than wasted when they are allowed to stay on the tree.

When I have two bushels of pears on a tree, I pick off one bushel, and those that are left are worth twice as much. There are two ways of thinning a tree. If you love your tree, and if you think more of the tree than of the fruit that grows on it, go out and look up into the trees in the springtime, and if you find that the buds are too thick, pick off one here and there — that helps more than the thinning of the fruit. On more than one occasion I have seen a man bring in a dozen good pears as specimens, but they were not a dozen selected out of a bushel; he had plenty more just like them. All good ones will bring a double price, so there is no money lost.

Now there are other questions which, of course, any beginner or amateur, in raising pears, will run up against. I will say, in reference to the question of what is called the pear blight, that I do not think I ought to go into that extensively to-day. It is, I believe, attributed to two causes,— one is that the sap becomes unhealthy, and the other the ravages of a small insect. We have found, however, that some varieties are more subject to it than others. These are very rapid growing varieties, and always grow very late in the fall. Two which have come under my particular observation, and which would be very fine pears, and generally liked, if it were not for the pear blight, are the Clapp's Favorite and the Lucrative.

Then comes the question of picking the pears and ripening them. We will try to condense what we have to say on this point. There is one pear that is better ripened on the tree than off, and that is the Seckel. Every other one that I have had experience with, is better taken off of the tree and put in a cool, dark place, preferably in the house; or if you have the right kind of a cellar, a cool, dry one, in the cellar. The quality is very much beyond that of a pear which is allowed to ripen on the tree. The September and the early October pears, with the exception of the Seckel, if left on the tree would rot at the core and would not be fit to eat. So you want to take this as a principle — that you must ripen your pears off of the tree.

Then might come the question as to what our best varieties are. Well, this Society has the best five and the best ten, in

its opinion, but other people have their ideas, and it is as I said before, entirely a question of taste. I will take you into my confidence to this extent — the ten which I am cultivating are the Rostiezer, Clapp's Favorite, Bartlett, Seckel, Sheldon, Anjou, Comice, Lawrence, Bosc, and Dana's Hovey. Somebody, perhaps, may drop one of those and put in Frederick Clapp, and some one else may drop another and put in something else, and so on. But I will say that I grow the Rostiezer and the Clapp's Favorite only because they are the two best pears on an average that get ripe before the Bartlett. The Bartlett, Bosc, Sheldon, Anjou and Lawrence, because of their quality, and the Comice I grow because it is a hard pear to grow and of the best quality when you get it; indeed, its quality is unsurpassed by that of any other pear. That is my taste; another man may not think so, but all will agree that it is of the very first quality, even if they do not care to grow it.

Another thing that I would say before I drop the subject of pear culture is that there are very few of these varieties which I have mentioned that are of recent production or origin. The Dana's Hovey and the Frederick Clapp are the only pears which I have mentioned here that we did not raise fifty or sixty years ago; so there are only two varieties that we have got in the last thirty or forty years. Occasionally a new variety flashes upon our attention and we hear a great deal about it at the time, as for instance, the Idaho, which was heralded all over the country as the "coming pear." It was a great pear; it was coming to fill a place and a want that had never been occupied before; it was going to stand at the head of the list. Now we have tried it in New England, and whatever it may be in the South or in the West, I can say that here I have never seen any specimens of it that were over third-class; I have never seen any I would call second-class; therefore the beginner in pear culture had better try some of the standard varieties that have been grown for thirty or forty years, rather than to take some of the new varieties which are heralded with so much noise by tree agents.

10th February, A. D. 1898.

# ESSAY

BY

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*Theme:—Horticultural Interests in Relation to Public Education.*

*Mr. President and Members of the Society:*—Personally, I should very much prefer to hear a discussion from the members of the Society on the relations between horticultural interests and education, than to try to tell you anything about them myself, and I hope that we may have a discussion of the subject which may be of great value to myself and to the city at large. I am, however, encouraged to take up this subject by the fact that in reading over the reports of the Society, as I always have from year to year, it has seemed to me that I am not bringing forward anything that flavors of innovation. The Society has certainly fought a good fight for over fifty years, and in all that time the sole purpose and aim has seemed to be purely and simply educational. It has existed strictly as an educational institution, a veritable college of horticulture, in the very best sense of the word.

I hope the country is now waking up to the fact that there are different kinds of education, good, indifferent and bad; and very different qualities of knowledge in consequence of different methods by which we educate. For this we have the luminous discriminations in Holy Writ between the "knowledge that puffeth up" and "the excellency of knowledge that giveth life," "knowledge that is to be desired rather than choice gold" and knowledge of which Isaiah says, "Thy wisdom and thy knowl-

edge, it hath perverted thee." Yankee sagacity has always looked with distrust on "book learning," still it has come to be the vastly predominating kind of learning in our public schools. And why should this be? The idea that the child knows something when he has learned to say it from a book is the great stumbling block now in our public education, and the only hope for our present situation, the only remedy for this parrot-like educational farce, seems to lie in the direction of improving the quality of knowledge taught in the school.

As a matter of education, do we ponder enough and learn as much as we might from the way a little child begins to study the world in which he finds himself? A baby sleeps most of the time the first year and still at the end of three years it has been estimated that he has made more actual progress and learned more things than in thirty years following. At the end of this early period, the brain has grown to be about five-sixths the size of the adult, and the development of this important organ is completed, so far as weight is concerned, by about the sixth or seventh year for girls and the eighth or ninth for boys. In this very early period, before formal schooling is begun, the child learns by what we call the natural method. He learns things, realities about him, by direct contact; he feels, smells, tastes, sees, hears the objects about him, soaking in unconsciously, as it were, an infinite amount of information At the end of this period, our school system changes rather abruptly, a child's method of learning from the real and natural to the symbolic. In place of studying things, he must study numbers, arbitrary figures which represent things, and words which tell about things.

We may represent the natural method of education and the symbolical by this simple example: Suppose we had set before us the task of learning a furnished house outside and in. We might sit down to a book as thick as a dictionary and study through it page after page, learning it faithfully by heart, all about the arrangement of doors, windows, outside grounds, everything of that sort; and even after we have done all this, what would such knowledge amount to? Suppose instead we

visit the house and look it over, take in the outside appearance, pass in review the things in the different rooms. We have learned the house at a glance, almost unconsciously, almost without effort. It would have taken us days, possibly weeks, to learn so much about it by the symbolical method. Further than this our book knowledge, as we have it in mind before coming to the house, may prove an absolute incumbrance, from the fact that there would be a constant tendency to refer things to the book. For instance, we would be repeating, "The book says, 'Five feet from the front door there is a window, four feet from the ground, with twelve panes of glass.' Oh yes! that is the window," when at a glance we have seen it and taken it all in. Most of this is a waste of time. This illustration is not so different from the case of a child who is under the necessity of learning something of the world about him, and my only reason for presenting it to you is to raise the query, whether elementary education might not be made more substantial by continuing as long as possible in the natural method of learning. But we must bear in mind that we cannot go far without the use of symbols. When things become too numerous and cumbersome for easy manipulation, then the mind will naturally come to substitute the word and symbol, and these by reason of long past experience will have about them the quality of reality.

An important feature of the natural education of the child is that it is so largely active rather than passive. He learns by acting, doing, and trying to do all manner of things. In universities and higher schools, we are returning to this method of childhood in the laboratory courses, and in the manual training and cooking; and at the other end of our educational scale, we are trying to realize its ideal in the occupations of the kindergarten. The great movement at present is towards drawing out the best activities of the child, and we need this throughout the grades from the kindergarten to the college. As Dr. Burnham has expressed it, "The great maxim of modern reform in education is the activity of the pupil instead of the didactics of the teacher." You see from this what I mean when I say that the Worcester County Horticultural Society has been an educational

institution, a true college of horticulture of the best type. From the first foundation in the early forties to the 1897 report of Secretary LINCOLN, saturating every report, permeating every exhibit, is that clear educational purpose to "*advance the science and to encourage and improve the practice of horticulture.*" Thus knowledge and action have gone from the first hand in hand as they always should. Socrates and Plato taught as a foundation for all educational systems that knowledge is the first step toward virtue, and the doing of knowledge is its perfection. And if we could have this kind of education, the kind of education that the Worcester County Horticultural Society has been standing for all these years with relation to the subject which it teaches, permeating the population of our city, we might have less of this flimsy style of education that serves to unfit so many for real efficiency and the best enjoyment of life.

To what extent the Society has had in mind active co-operation with the public schools, I am unable to say; many of you could speak more to the point on that subject. I could, however, quote many instances where such relations are hinted at. "Your Secretary," says the Transactions of 1897, "would put his faith in the Common rather than the High School, where both cannot be had. He would educate the mass, at public expense, instead of a class. He would '*Advance the Science and improve the Practice of Horticulture' so that each family, in possession of its own homestead, should learn how best to cultivate its area, however contracted.*"

In an earlier report he also reminds the Society: "Our older members are rapidly passing away; is there promise that their places will be filled? Certainly there can be no hope of it from a county which, save in title, has ceased to maintain any distinctive connection with the Society. But looking straight ahead, what reasonable prospect is there of keeping up—let alone advancing—the position and repute of the Society in Floriculture?" We also read in our own Transactions: "The highest mission of the Horticultural Society is to lend its strongest influence to the educating of children to a love of flowers which will lead them to be willing to give time and labor for their cultivation."

I feel at some disadvantage in speaking upon these points, since we all realize that theory and practice should go hand in hand, and facing so many of you and being obliged to confess that throughout the history of the Society, although I have attended the exhibits, I have not produced a single thing to exhibit. I plead guilty on that score, and would say that the position of a teacher working for a salary is not that of a citizen in a home of his own. It has been my bad luck to move from place to place a good deal, and it has not been my good fortune, as is the case with most of our good Methodist preachers to drop into a parsonage which has already received some attention horticulturally. It has been my lot, rather, to find a place where the wilderness has not been very much disturbed, and I can really say, to clear myself on this point, that in the last ten years it has been something like five different places that I have inhabited, and whereas they were generally found in a state of gravel banks or patches of brush and sod, I have left vines and trees in all but one of them. You see, however, the disadvantage that a man taking a place of that sort has in competing with any of the older gardeners who have their soil in cultivation and everything in fine bearing shape. But as possibly some of you know, I have not kept my hands absolutely clean from mother earth, and there is nothing I enjoy really better than going out and digging in the garden, so that I can say from the bottom of my heart that what we want as a Horticultural Society is to promote the knowledge of horticulture in the city, and cultivate the will and the purpose, the ability and the practice, of successful horticulture.

We are now ready to take stock for a moment of our city's horticultural interests, and note how these may be increased, and promoted possibly, by the co-operation of the Society with the public schools.

It is probably the greatest horticultural interest, the solidest and most valuable, that each house lot be provided with the best flowers and the best fruits for the health, comfort and happiness of the family and the community. Many parts of Worcester are extremely fortunate in the education which this Society has

largely disseminated, and we have a fine array of floral decorations in the gardens and very generally a goodly supply of fruit. That applies to certain parts of the city. The most serious drawback, the most insurmountable obstacle to the full development of this great interest, as has been pointed out many times by your late Secretary, is juvenile vandalism. "This evil," he says, "is rapidly developing as our city grows in population, with a portion of which it would seem to be an accepted theory that there can be no private property in flowers or fruits. Their cultivation will have to be abandoned, however reluctantly, until juvenile trespass and theft can be effectually arrested."

This is a matter the seriousness of which I referred to on a former occasion, and it cannot be overstated for a city like this. I have never lived in a city where the people are so pestered by the juvenile population as here in Worcester. What are we to do about it? What position is the Society taking in regard to this matter, and what steps is it taking to remedy the evil? Do we realize fully that the best way to meet this difficulty must be to encourage the children in the cultivation of flowers and fruits of their own? A child who has planted and reared something of his own can appreciate, as he or she can hardly be made to appreciate in any other way, the rights of ownership. We may in this way, by encouraging the child's cultivation of things, lay a solid foundation for conduct which no amount of law, preaching and punishment can ever do.

A second solid interest consists in our roadside and park trees. It is a matter of profound regret that Mr. Draper in his excellent discussion of trees for roadside decoration is obliged to rule out the chestnut and the walnut on account of the clubbing and abuse of the boys. It is a pitiful commentary on parental control if that is the way we must settle the question of our roadside trees,—in the negative against such trees as the chestnut. Now the evil of just this thing is so widespread that we may dwell on it for a moment. I have talked with a number of farmers and the voice is universal, the vote unanimous, that we are obliged to cut our chestnut trees, our nut trees generally, to clear them out from wherever they may offer temptation to trespassers.

Can that be the final settlement of a question like this? I really hope not. For myself, I would be willing to pledge a hundred dollars to any farmer who is annoyed in any way from the trespassing of a boy of mine, and if all the parents in the city would do the same, what might we have in just this respect? We might have our roadsides and our pastures so full of chestnuts and walnuts that we could gather them to burn. What is the state of the case now? I saw a man walking under a large chestnut tree at the corner of Woodland and Charlotte streets, kicking the leaves up as he went along, and just as he passed me, I heard him growl, "Four boys to one chestnut, no use," and so it goes. The world might be very much better if we took hold of the sources of these evils which lie in the proper education of the young.

Following now the horticultural interests further, we find that they divide into two branches; each covered by an organization in the city of Worcester. There is a great horticultural interest which connects itself with our birds. They are the protectors, the stewards, the saviours, of our orchards and gardens, therefore it would be perfectly legitimate for a Horticultural Society like this to encourage in every way possible the protection of birds, and the education of children with reference to the value of the different species to the community. It has been said by an eminent French naturalist that if birds were destroyed entirely the world would become uninhabitable within nine years' time through the ravages of insects; and this in spite of all the spray pumps and insecticides we could get. We make little enough of this horticultural interest in our education, still this lies in the line of work to be done by the Natural History Society. And so with another great horticultural interest, the methods of dealing with the insects themselves. We have them, for observation and for study by the child population of the city, all the time with us, and it would cost nothing whatever for laboratories or apparatus in the schools to make the study of insects such that every child in the city, by the time it had completed the ninth grade work, would know possibly a hundred of the insects which have most influence on our horticultural prosperity.

He could know the coddling moth and the best thing to do with respect to it, the tent caterpillars, the canker worms, cut worms, aphids, rose beetles, our flies and mosquitos and a host of others. He could learn about them without going outside of the city limits, by simply seeing what is going on in his own back yard. This work belongs equally to the Natural History Society, and I am happy to see that it is being taken up by that organization. In planning work of this sort, we must remember that the school courses are already being overcrowded. This is a point we must take into careful consideration. It is, however, a good thing; for we are under the obligation, whenever we attempt to add anything to school work, to make it a thing so good that the people will be glad to let something be dropped which is not so good in the school course that this may be taken up. In this way, only the best possible lines of work for the children can be introduced into the schools.

As I say, the Natural History Society has taken up this matter, especially for the study of insects and birds, and it is to be hoped that a great deal can be done in this line. Boxes and cases have been provided by the Natural History Society. These will be left in the different schools where teachers desire to take this up as a part of their nature work. The children are to be encouraged, and they are anxious to do this kind of work, to collect insects, bring them in, and they may be allowed to spend some of the time after their other lessons are learned in preparation of these cases, in the mounting of the insects and the study of live insects in cages, feeding upon the leaves of our different plants, all of which can be easily provided in the school-rooms.

Many of our moths and butterflies readily lay their eggs in confinement. These with the eggs which the children can bring in from outside may be allowed to hatch. The children may then rear the larvæ, feeding them with the leaves of their various food plants. When full grown, they may be seen to spin their cocoons and undergo their transformation into pupæ and finally to emerge as the adult moth or butterfly. The class may

thus have in living form under their own eyes the whole life stories of many of our more interesting and important insects. In the higher grades, and wherever practicable, they may study and estimate the damage which a single pair of insects can do in a season and get clear practical ideas of methods of destroying them. During the study, series of specimens, the egg and egg cluster, caterpillars or larvæ of different sizes and ages, cocoons, and chrysalids, and the male and female adult, may be permanently mounted. The next year the class may work out some other species in the same way. I should begin with the insects that do the most harm or the most good and work from those down to others of less importance, and we should find enough to keep the child population busy, with something new and interesting each year, for at least one hundred years to come.

The Natural History Society offers to furnish convenient cases in which the specimens may be preserved, to store and care for the collections and to issue them to the schools as they are needed. A great many valuable specimens are collected every year, but the teachers and pupils go away in June and do not come back until September, and when they do come back, it is only to find a little pile of dust underneath where the specimens had been to show how well the museum pests had enjoyed their feast. But if we can have them saved from year to year by the Natural History Society, we shall have in a few years collections, and plenty of them, of the insects which we want to know most about right here in the city, collections which every child can have in his hand some time during the year and study by the natural method. This will result in the dissemination of knowledge throughout the city which will be of untold value not only educationally but horticulturally as well.

Of course you know better than I do the ravages which these insects create. Take the coddling moth for example. I have had a lot of apples counted this winter with the result that something over ninety per cent., as they go in the ordinary run of market apples, were wormy. Other pests in the way of the railroad worm, the canker worm, the white marked tussock moth,

the tent caterpillars, and many others are better known to the members of this society than to myself.

Then the birds and insects, we may leave with the Natural History Society, and I suppose too we should leave to that organization some other very important matters connected with our horticultural interests. Take for example the bats. Those are Natural History specimens of course, but what the bats do in a country is undoubtedly a horticultural interest. We have the birds to take care of the insects—the swallows and the fly-catchers in the air, the perchers and warblers in the trees, and a number of birds on the ground—but all of these are day feeding. A great many of the insects have dodged the birds by taking recourse to the night, so that many of our most noxious and destructive insects are nocturnal, like the coddling moth itself. Bats are the only animals which can serve us for night-flying insects. They fly from dusk to early morning, collecting insects much of the time. We have no idea how much good one of these little creatures does in a community. Night after night I see them about the orchard, and the value of one of these little animals, I think, might easily amount to fifty dollars a year. And still our education on just this point fails, when it is possible for boys, as I found only a year ago, to go into a barn where bats are colonized and poke them out and knock them down with hay rakes, "for the fun of it." On such points as this our horticultural and our educational interests should be made to focus. We should teach the children in what way they are contravening important interests of the community by action of this sort. It is really a lack in education, and there is no blame to be attached to the children, and I do not think there is any blame to be attached to them for stoning and clubbing the chestnut trees. It is all, it seems to me, a matter of quality of education; and our problem is to give them a quality of education which shall make such vandalism impossible.

Again, too, as to our common toad; its work in the city constitutes a great horticultural interest, very little appreciated, but which every child should know. The damage and annoyance caused by insects is something enormous. At a recent meeting

one of our members stated that the destruction of robins in the South during a recent winter led to greater loss in Massachusetts on account of the increased ravages of cutworms than that caused by the frosts in Florida. It is true our robins are fairly efficient destroyers of cutworms, still they only feed by day, while cutworms work at night, and robins can get at them only in the late evening and early morning. The toad feeds all night and only on the ground, where the cutworm is at work. Furthermore, as we learn from Mr. Kirkland's recent work (and this is something well worth the entire cost of our Agricultural Experiment Station for the year, if the people are wise enough to utilize his results) cutworms form a considerable part of the toad's food. From examinations of a large number of toads' stomachs Kirkland estimates that a single toad may destroy over 2,000 cutworms during the months of May, June and July, and that from this item alone a single one of these harmless creatures may well do a gardener service to the amount of $19.88 each season. A number of our experiment stations are at work upon some method of ridding gardens of cutworms, and they have tried various poisons and devised various ways of applying them ; but what we really need is sufficient public education to protect and properly utilize our valuable little friend, the toad.

In order to illustrate what I mean by education in such lines allow me to instance the following example. Since coming to Worcester, my feelings have been greatly outraged every spring by the way the boys clubbed and stoned the toads in the little pond in University Park. Toward the latter part of April or the first few days of May the toads of a neighborhood gather in the nearest stagnant water to deposit their eggs. Since most of the natural pools in a city are either filled in or drained, they crowd into the remaining ponds literally by the thousands. If the weather is warm the eggs are laid within a day or two of entering the water and the toads return, probably to the same yards and gardens from which they came. In the particular pond in question they gather in shoals in which a single blow of a stick might kill half a dozen and a stone could hardly fail to mutilate

one or two. Different individuals coming from varying distances naturally reach the water at different times, so that the breeding season generally extends over two or three weeks. Almost any hour of the day, during this time, the children could be seen running round and round the pond clubbing and stoning the toads. Great numbers were not killed outright and could be seen struggling about in the water with legs broken and dangling and entrails exposed or eyes crushed out. In walking once around the pond, I counted 200 dead or mutilated toads, and a little boy told me that the day before he and another boy had killed 300 by count and carried them off in an old milk can. I do not suppose that this 500 represents more than one tenth of the whole number wantonly destroyed by the boys each year in this single pond. Furthermore, for each female toad killed at this season we lose the 8,000 to 12,000 eggs that she would have laid. A system of parental and public education which makes possible any such wanton cruelty and destruction of valuable life is certainly faulty in the extreme. And a community in which it exists ought to be pestered to the limits of endurance by mosquitoes, flies and gnats, and have the greater share of its flowers, fruits and vegetables destroyed by insects. It is too light a punishment to fit the crime against nature.

Such being the condition of affairs, what can rational education do to better it? A great many croakers answer: "Nothing. The passion to kill is so strong in children that all education is powerless to stop them." The following, however, are the facts:

On the 31st of March I gave a brief statement to the Worcester papers pointing out a few of the interesting facts in the life history of the toad and asking the school children to learn the value and use of the animal to the community. The toads came to the pond to lay April 25 and, the weather turning cold, numbers could be found in the water up to May 14. During this time I visited the pond daily, especially at times when the children passed to and from school. The children gathered in groups and watched the toads with great interest and gathered hands full of eggs to take to school, but I did not see a child offer to harm a toad. More than this, I found no evidence that

any had been wantonly killed. People living in the neighborhood and the man who takes care of the park remarked to me that the children were not killing toads as in former years. A boy was overheard to say: "The kids are not killing the frogs as they did last year." I asked him why it was. "Oh," he said, "they read something in the papers, I guess."

I should have been satisfied, if such a result had been attained in five or ten years; but, here we had it within a month. Certainly nothing in recent years has given me more encouragement and demonstrated more clearly the possibilities of rational education than just this little circumstance. If we can keep it up and have this kind of education in all lines of nature study we can soon have a most remarkably comfortable city to live in, and it would be worth in actual fruit, flowers and vegetables saved to the community a large part of what our public schools are costing.

I mention these things in the hope that by appreciating the wide range of our horticultural interests, by realizing their intimate relations to the education of the young, we may as a Society widen our sphere of influence to even more actively encourage and support this living kind of knowledge, for which we have done so much in the past.

Turning to still another line of work, if possible, even more specifically horticultural we may ask, How can we interest and encourage children in the cultivation of fruits and flowers? We are often told that it is difficult to interest children in raising flowers, and this is true. It is probably safe to say that horticulture is a love which generally develops later in life. Still there are many exceptions to this rule. We not infrequently find children of even four, five and upwards with a veritable passion for planting things, and I am inclined to think by beginning young enough and by adopting suitable methods, we might not only interest the children but establish in them a life-long love for the culture of flowers and thus greatly increase the number of amateur horticulturists in the city.

For suggestions as to ways and methods to this end we may cite again the policy by which this Society has kept its exhibits

flourishing and its own members active and interested for more than fifty years. I refer to the matter of offering prizes for the best specimens grown. This has introduced helpful competition, thus making the progress of the Society an interesting game, already more than fifty years long. Bringing in a little fun, a spice of rivalry, used to make spelling, and dull old-fashioned parsing, interesting. To stand at the head or foot of the class sufficed to make the old spelling class the most interesting and enjoyable exercise of the whole day, simply because we made a game of it, and this is one the elements of the natural education which I hope is coming. By all manner of moralizing or preaching we might fail to get a child to put his whole soul into the raising of a plant; and very possibly we could not succeed in hiring him to do it. But make a game of it, and the children take to it like ducks to water. The experiment was tried in one of our schools last year, and, although from lack of experience the plan followed was not as good as it might have been, I was agreeably surprised at the results. The experiment consisted in giving to each child who wished to try, in all the rooms in the building, a certain number of flower seeds from the same packet, offering small prizes for the best plants brought in at the end of the spring term. I have found it somewhat difficult to get the public to grasp the purpose of this work. The idea is not so much to raise a beautiful plant. We can hardly expect this, especially at first, from children who have never planted a seed in their lives. All we can expect is that each child shall rear the best plant that he can. It is a matter of no great consequence whether the plant be June grass or some rare flower. The putting of his whole soul into making it grow as well as he can, better than someone else, in order to give it the character of a game, this is the real purpose of the work.

Think for a moment what a large lesson we have given our child. In order to master it properly, how much he must learn about soils, plant food in the soil, the influence of warmth, moisture and sunlight, the prevention of plant diseases and the destruction of injurious insects. It is in fact the lesson of the

whole human race in learning the influence of all cultural conditions upon plant growth; the problem of making two blades of grass grow where only one grew before. In giving this lesson we thus place the child in the great tide of human effort which has done more than anything else to advance civilization. There is no bottom and no limit to the amount a child or a man, a horticultural society, or a human race, can learn in such a lesson as this. And, we may add, from throwing about his little plant the best possible conditions of life and growth, it is only a short step, it is in essence the same thing, to placing around any human life that may be entrusted to his care the most favorable conditions for growth, not only physical, but mental and moral as well.

As a matter of fact, with the kind assistance of your Secretary, a list of about ten plants were selected which would grow rapidly and bloom by the middle of June, thus giving the children an added satisfaction. Each room was given seeds of the same plant, something very easy, dwarf nasturtium, for the first grade; and we attempted to distribute them so that the ascending grades would each have a slightly more difficult task. Still the highest grade had dwarf petunia. This is certainly easy to rear, but not one child in the room succeeded in raising a plant from his seeds. As intimated above, the plan of conducting the experiment was faulty, as to choice of varieties in the first place, but especially in the fact that the children were not told what kind of seeds had been given them. The idea being to let them, as it were, read a continued story and be eager to see the outcome. But neither parents nor children knew what to look for as the plants came up, and not recognizing them, in many instances, pulled up the flowers and saved the more showy weeds instead. And weeds formed a large part of most of the exhibits. In fact, nothing but weeds were exhibited in the highest grade, and, I fear, the worthy members of this Society who were kind enough to act as judges, Mr. Hadwen and the Hon. Henry L. Parker, considered the experiment a failure. To my own mind, nothing could more fully demonstrate the value and the absolute necessity of such work. Think of it!

Children growing up in a civilized community, who have never planted a seed, who do not know the difference, who cannot tell a flower plant from a weed! Recent investigations have revealed the fact that most of our tramps are not foreign born, as we are wont to suppose, but are native Americans, the legitimate product of our boasted public school system. During the past year I have been studying tramps a little for my own enlightenment. The great majority of them have been through our grade schools. Some have even attended the high schools. Nine out of ten, about, when asked whether they have ever planted a seed and reared a plant will answer: "No." Put to work in the garden, very few can tell weeds from garden plants. Most of them don't even know beans, until they are baked. As far as knowing how to do a little something practical for old Mother Earth, they are paralytic incapables. With our artificial city life are we not allowing ourselves to drift unnecessarily far away from man's safe anchorage and universal source of supply, the soil? This Society has surely been the sheet-anchor of Worcester in this respect; but can it not greatly increase its efficiency and influence by gaining a hold on the children, before they have drifted too far?

In the experiment of flower raising, just described, some of the older children hung off last year. This year it is being tried again in the same school and every child has taken the seeds. And their interest and eagerness in the work is almost pathetic. In the room which had bachelor's button seeds the children were given five seeds apiece, but the last little boy had only four; and for two or three days, until a larger supply of seeds could be obtained, he daily came to his teacher, almost with tears in his eyes, to ask: "When is my other seed coming?" So far, the experiment has demonstrated how generally and how easily children may be interested in raising plants, if approached in the right way. And it seems on the face of it so valuable, the children get so much real and delightful knowledge out of it, that I am in hopes that the plan may be adopted as a feature of elementary botany work throughout the schools of the city. I should certainly prefer that a boy of mine learn how to raise one

plant well than to learn the names of a hundred. The part that I hoped the Horticultural Society might take in the work is simply to offer a few of its prizes, say in connection with two exhibitions, one in June and the other in October, for the best plants raised by children in our public schools. Then the prize winners in the different schools might compete with one another in these exhibitions. This would increase the interest, unify the work of the whole city, and give the Horticultural Society the position which it ought to hold, a position foremost of all our civic organizations in "advancing the science and in encouraging and improving the practice of horticulture" among the whole people of our city. As a policy to enable the Society to reach the whole city, to encourage horticulture generally, and to draw the best young men and young women to its membership and its life-long support, I can conceive of none more strategic than this. "Our older members are rapidly passing away; is there promise that their places will be filled?" Would not the adoption of such a policy enable us to answer the oft repeated question of our lamented Secretary more hopefully? I am aware that your committee has decided not to undertake the work this year. On the whole, I think the decision has been wise; for the plan has hardly been sufficiently developed as yet in the schools. I am, however, glad of an opportunity to present the matter in this general way to the Society, and I hope, when the time is ripe, that the children will not reach up in vain to the Horticultural Society for a helping hand.

Time does not permit me to even indicate the wide range of subjects that may be taken up and the great importance of the horticultural interests involved.

In planning the school course there are plants enough, as many as you please, and as easy and as hard to raise as need be. We may begin with nasturtiums and bachelor's buttons in the lower grades and give them a try at carnations, begonias and roses in the higher grades. In the high school we may go on to subjects like hybridization and the origination of new varieties. The plan is looked upon very favorably by our professional horticulturists in Amherst, from whom we may hope for the newest

and best information and much substantial aid in the near future. Professor Maynard sees no objection to asking the children to undertake the cultivation of fruits as well as flowers. Encourage a child, for example, to plant a bed of strawberries. If it was no more than a yard square, or even a single plant, he might learn their manner of growth and propagation; and, with some of our best varieties, would certainly surprise his teachers and parents, as well as himself, with the size and quantity he could grow. Arrangements have already been made to begin this in some of the schools the coming spring. Then there is the whole list of small fruits,—raspberries, blackberries, currants, gooseberries, —as well as grapes, peaches, cherries and even apples, each one of which any child might have something to do with actually propagating and growing during his school course.

But the subject is even wider. In the study of each plant the children will find it necessary to learn something about the insect pests that feed upon it and the numerous fungous diseases that attack it. At this point, we come to the chief reason why the Horticultural Society should take hold of the work, and why it could not do better than to operate through the public schools. The reason is that many of these insect pests and fungous diseases cannot be successfully dealt with by single individuals. They are no respectors of city lot fences, and it is useless for one man to begin the fight, unless his neighbors all join in. The great need at present is the laying of a solid foundation of common knowledge about these things underneath the whole community. How can we do this, except by working through our schools? It is a splendid system, and the only one we have, which touches every home in the city. I am aware that in trying to introduce new lines of, so called, science work into the school course, parents are apt to say: "I did not have to learn any of this stuff, and what was good enough for me is good enough for my boy." I used to think this was a hard way of looking at things, but now I am glad people take this view of it. It simply necessitates that we make the work so good that parents will say instead: "I had no chance to learn these things

and have no time to learn them now, but I wish my children might learn them and tell me all about them."

It is high time we faced these problems. Since the occupation of the country we have been practically spreading horticultural feasts before our worst enemies, insects and plant diseases. Our leading entomologists already estimate that the insects divide the crops about equally with the farmer. It certainly is time that we have as a matter of common knowledge the fact that if a man keeps a neglected orchard, he may be causing his neighbors hundreds of dollars worth of damage each year. In a short time, with proper encouragement, we might have our school children possessed of sufficient knowledge to clear the city of these pests, and when the community is able to act as one man in the matter, it will not be so difficult.

On the side of fungous plant diseases take for a single example the black knot. Worcester is full of it. How many people know anything about it? It is really pitiful to see where home-makers have bought their lot and set out their plum and cherry trees; and then as they come into bearing these ugly knots form and kill the trees. Worst of all, the people lose heart and come to the conclusion that the world is becoming too rotten to try to raise fruit in it any more. The black knot forms as a tumor in the healthy tissues of the tree. This finally sends great numbers of filaments to the surface and these discharge clouds of minute spores into the air. The spores from a single knot, falling on healthy trees, may thus infect a whole neighborhood. The only thing to do is to cut out and burn every trace of the fungus as soon as it appears and before spores are set free. Why not teach such things as these in our schools? The material is all about us. It would cost nothing for specimens. And in a year we might have boys of twelve or fifteen able to clean up the black knots in their fathers' orchards, and be much the better both for the knowledge and the work. The same applies to a great many of our blights and rusts and mildews, but time forbids mentioning them in detail.

The subject, horticultural interests in relation to public education, has proved far too large to discuss in a single hour. I

hope, however, that we may continue to devote some earnest consideration to the matter. For some time it has seemed to me that by taking hold of the horticultural education in the schools, the Society might serve the city as it could in no other way. At the same time I can see no surer plan by which to interest the rising generation in the noble purpose to "'Advance the Science and improve the Practice of Horticulture,' so that each family in the possession of its own homestead should learn how best to cultivate its area, however contracted." A little prize money directed toward encouraging our young people to study a few of the problems of most vital importance to the horticultural interests of Worcester, must bring in returns a hundred fold, both practical and educational, not only to the entire city, but to our Society as well.

17th February, A. D. 1898.

# ESSAY

BY

PROF. A. A. BRIGHAM,

RHODE ISLAND AGRICULTURAL COLLEGE.

*Theme:—Japan.*

Illustrated with stereopticon.

*Mr. President, Ladies and Gentlemen:*—I am very happy to be with you today and to meet so many of my old friends. I shall take you a long but quick journey, especially in going and returning. I will try, during our stay in Japan, to give you some idea of that strange country, so that by using both your eyes and your ears you may be able to gain information that will possibly be of interest to you. Better than this, I hope it will bring us, as a community, into closer communion with the very delightful people of the "Land of the Rising Sun." It does not take long for us to cross our own country to the Pacific Ocean, and after once getting to San Francisco or Vancouver, we take a steamship which will cross the Pacific Ocean in from fifteen to twenty days. Passing out from San Francisco, we are soon upon the broadest ocean of our globe, and right here I wish to protest against the name "*Pacific*" being applied to this ocean. I assure you that it was a great mistake of Balboa, when he discovered this so called ocean, and named it as the Germans call it, "The Great, Still Ocean." For I firmly believe that this ocean is never "pacific." It is always on the move, and generally moving in several directions at once. If you do not believe it, you should take a trip to Japan, and you will find that although the ship may be five hundred feet long it will pitch and roll to your satisfaction on this score and perhaps to your dissatisfaction in several respects.

This ocean ought to be called the "Furific" Ocean or the "Terrific" Ocean, for I assure you that it has motion enough to bring the dead to life. In proof of this I will say that on the ship in which we sailed there were in the steerage many Chinamen. The boat's company had taken a contract to land these men, either living or dead, in their native land. Two of them died on the passage over, and were embalmed and placed in boxes. But one night we had a gale and there was so much motion in the ship that one of these Celestials bounced out of his box and went rolling around the room, thus proving that there is enough motion in this Pacific Ocean to bring the dead back to life. Another case occurred upon another boat where a missionary and his bride were going out to China. There came up a terrible storm and at one time the waves were so high and the winds blew so strongly that the upper cabin was carried away. This couple were sitting in the dining-hall. As the upper part of the dining-hall was swept away the young man was swept along, too, separated from his newly-wedded wife and carried out toward the ocean. He went just to the rail and there balanced. It was hard telling whether he would go farther or come back, but the motion had reached its climax and he came back to his wife. So you see that a man who was practically the same as dead, was brought back to life. If you cross the Pacific you will find that this body of water is indeed terrific in the amount of its movement.

As we pass over this ocean we have almost no companions on the sea. During our long voyage of twenty-one days we saw nothing that had life except the albatrosses. Not even a whale was visible, and it became rather monotonous. Still we had a good company on board, and after many days we finally came to this land that I am to speak of this afternoon. This empire, as it is called, of Japan is a very long land, but is made up of very small islands, five principal and four hundred smaller ones. The empire extends between latitudes which correspond on our side of the globe to those of Newfoundland on the north and Cuba on the south. The land is in shape very much like a snake, as you will see by the map. It has a population of

40,000,000, and since the capture of the island of Formosa from the Chinese there are 8,000,000 more inhabitants to be added.

As you approach Japan the first sight, if the sky is clear, is the top of their sacred mountain of Fujiyama. As we came near this empire we saw no land that we could recognize as such, but away up in the clouds the top of this great mountain appeared, and the sun shone on it giving a crimson tinge to its snow capped summit.

Here is a picture of Yokohama harbor. We spent several days near this harbor, which is one of the best in the world, and you notice on the shore quite a number of the Japanese houses. As you drop anchor in the harbor, one of the most curious things that strikes you is the large number of little boats manned by little Japanese boatmen, who row out to the ship to take you ashore. Perhaps you will prefer to go ashore on a steam launch in a civilized manner, but there is far more fun in taking one of the little boats, or "sampans," and being sculled ashore by one of these almost naked "brownies," as we might call them.

When you come into the city of Yokohama, it is a question whether you shall go to a European hotel and have all the luxuries which you would get in the best French hotels, or whether you shall go to a Japanese hotel. Here is a picture of a Japanese hotel. The main floor is several feet above the ground, and there is a veranda running around it, and there you see the rooms inside. Those persons sitting upon the floor are in one of the guest rooms. The door on the left is one of the sliding doors that make up the side of a room in Japan. These doors slide clear to the corners on each side. They may be opened wide, or taken out as is usually the way in the daytime, in both their dwellings and stores, so practically the Japanese live out of doors. It is very pleasant and healthful in the summer time. Then at night these inside doors are drawn together, and some wooden doors are drawn together on the outside, and all is closed for the night. As you go into the hotel you are met by servants, and they are very happy if they can take off your shoes for you. I had this experience in a genuine Japanese

hotel in the northern part of the empire, on the island of Yezo. Just previous to our arrival there had been a terrible snow-storm. We came to a Japanese hotel, and I was trying to ask a man about a train that was to take us to our destination. All the time that I was trying to talk to the man who had charge of the hotel, a little boy was working at my shoestrings. At first I took no notice of the little imp except to move my foot as though I would push away an obstacle, but the boy kept at it, and had got one shoe almost unlaced when I looked down and told him to stop. He didn't understand English, and kept on and got them both unlaced and was going to pull off the shoes. I objected very strongly and effectively to that, as I didn't care to have my shoes taken off, because I intended to go out in the snowy street. This, however, is the way in which you are met at the entrance to the hotel, and usually there are plenty of servants around that are trained to remove the visitor's shoes with ease and expedition.

Your first duty then on entering a Japanese hotel or house, if you intend to stop, is to take off your shoes, because in their houses the floors are covered with nice thick, straw mats, and they do not expect you to come in and injure their rooms. This is a picture of the hand-maiden. When you have been told where your room is, she conducts you to it, and is at your service. Here are some things that are typical of the Japanese room. In the first place, you have here a little fireplace, and this is where the heat comes from in most of the parts of Japan that call for heat in the houses. You are supposed to sit down by this little stove and keep warm, and the Japanese do it beautifully, and succeed in keeping perfectly warm, as the only thing they seem to want to keep warm is their hands. Their feet do not trouble them if they are cold. They cover themselves with many "kimonas," and thus keep warm. One can keep wonderfully warm with one of these little stoves in the room. If you cannot keep warm with the ordinary clothing you have only to call for a "futon," which is much like the old-fashioned "comfortable" of New England, and you crawl under this and go to sleep. Many a Japanese has done this, placing

the little charcoal stove under the blanket with him, and the gas from the burning coal has caused his death.

Of course it is necessary to eat in Japan ; and in order that you may know something of what you have to eat, we will go into the kitchen of the hotel. Here we find three girls working preparing the dinner you have ordered. One is cutting up some roots, another is stirring up some sort of combination that you have to guess at when it comes to your room, and the one standing up at the right is washing rice, so you get some idea of the interior of a Japanese kitchen. Here three servants do as much as one servant in America. The dress of the people in this picture and the cast of the countenance is all very typical of the true Japanese. Here is the servant who will bring in the food that you have ordered. You notice, he has your dinner on his shoulder, rice soup, fish, and very rarely meat, unless you order it especially, for the Japanese do not eat meat or anything else that has blood in it. In his hand he carries a lantern made of bamboo framework, covered over with rice paper, which is oiled, and very nearly transparent, and then ornamented with figures. It is used in the hotels and also on the street when it is necessary for extra light.

After your long journey, it is necessary to have your soiled linen washed. If you would like to have it laundried in the Japanese fashion, you have only to hand it to this girl and she will take it to the brook near by. She will take a tub with her and thinks she is working very hard, but she manages to see everything that is going on. Anything especially interesting will cause her hands to stop their work, and she will get all the enjoyment possible in looking about her.

Here you see the characteristic traits of the poorest class of the Japanese. You have also in the background some of the vines that you will always find even in the poorest Japanese garden. They take care of the little patch of ground, and they always have something planted there. The Japanese backyard is a piece of art. It is always kept in perfect order and has something beautiful growing in it.

Of course while you are in Japan you wish to learn as much

as possible of the interesting things in Japan. One of the most entertaining things is to have young ladies come in and read, dance and furnish music for you. Here are two girls who can be employed to come in and read from the Japanese books or play on Japanese musical instruments in your hotel. Here you have the characteristic dress of the people of Japan. They dress differently according to their class, and according to their age. The women especially are distinguished by the different kinds of dress. A little girl will be dressed in the brightest colors, mostly crimson and blue, and as they get a little older the colors are less bright, but they are striking. The girl who is standing there has a sash around her waist. This is the "Obi," the pride of the Japanese woman. Here is where most of the money furnished by her father is invested. The sash fits very nicely and gives her a very graceful appearance. It is wound round and round her waist (five or six yards of silk or sometimes velvet), and is tied in a bow behind. You notice the way her hair is done up. A Japanese lady never dresses her own hair. A regular hairdresser comes in and does her hair up to last four or five days. It is very carefully and very artistically done.

While we are in our room, it may be of interest to have the dancing-girls come in. Here are three. They generally belong to the middle class, and to some extent are of ill repute. But here they play an innocent rôle. Their form of beauty is very striking, a beauty that appeals to some eyes but not to others. I found the Japanese women to be very beautiful indeed, with a delicacy of feature and a healthfulness of body. These girls are dancing and what are called dancing-girls, but their dancing is very different from ours in America. Theirs consists of posturing, swaying to and fro, and bending and moving the body, and they do it very gracefully. You see some of the principal postures of the dancing-girl here. They always have a fan, and that takes part in their movements and adds attractiveness to them. You notice that these girls have their hair done up in the way that I showed you in a previous picture. They wear a peculiar kind of wooden shoes.

The floor is covered with rice mats, always three by six feet in size. When a Japanese house is complete, it must be of such dimensions that each room will include a certain number of these mats. They make the room look very neat indeed. The ornaments in a Japanese room are few. Here you find upon the wall a picture and that is about all you find in a Japanese room. Any ornaments or treasures are not kept in the house, and the bric-a-brac is all hidden away in a storehouse and is brought out when their friends come to see them. In a Japanese house there is very little furniture. There are no chairs, no stools, no mantels, with a thousand things upon them, and very few if any pictures. There may be a few mottoes and perhaps a little vase in the corner where one little spray of flowers is kept. This makes the labor of the housewife in Japan very slight. When she sweeps her rooms, she dusts them first.

After the dancing-girls are through, we will invite the musicians in. Here are two girl musicians. The one on the right is playing a "koto," which makes a sort of music that Americans do not appreciate. It sounds like thumping on a barrel. The one on the left is playing a samisen, an instrument that gives out more music, but which seems to be composed almost wholly of discords.

The same room must serve for the parlor, reception-room and chamber, if in humble circumstances. This is the way in which a Japanese woman sleeps. She sleeps upon the floor, and her head rests upon a peculiar kind of pillow which keeps her head above the floor and thus keeping the hair from getting out of shape. When cold weather comes they put one "kimona" or dress on over another until they are warm enough. I remember hearing one day of a girl in a mission school who came down to breakfast with thirteen of these kimonas on. The teacher told her to go to bed if she could not keep warm without so many of these on.

I will now show you more of Yokohama. There are two parts to this city, the foreign and the native. In the native or Japanese part, you see the low houses and the narrow streets. In the foreign part the buildings are large. Here is a mission

school. Here notice the innovation in the shape of a windmill. There are some very beautiful residences on the "Bluff," as it is called, where the Americans, Germans and those of other nationalities live. This is a Buddhist temple of Yokohama. The Japanese are a very religious people. Buddhism is the prevailing religion. Here is an immense image of Buddha, and if you look very closely you will notice the man standing at the middle of the image. The man is perhaps five feet tall and you can judge of the height of this image, which must be fully fifty feet. The statue is made of copper and iron. This represents the religion of the Japanese. The face represents the calmness, cheerfulness and the wisdom of Buddha. The Japanese people rarely show pain, sorrow or anything of that kind. And if they have anything sad to tell you, they will tell it with a laugh. It is not because they have no feeling, but they wish to break it to you gently. The one who represents their religion is supposed never to be moved by the trivialties of life, but holds himself firmly above them. A woman must never show sorrow in public, nor a troubled countenance to her husband or father, but must try to make things appear as pleasant as possible. It is curious to note how through the centuries they have been trained in this way. It has resulted in this perfect politeness and unceasing care for the comfort of those who are dear to them. I am sorry to say that the husband does not appreciate it all, but rather seems to think that the woman is only a servant and was born only to increase his pleasures. When they go out for a walk the woman must follow the man and so on. But in spite of all this the woman is today the hope of Japan. The men have so much conceit that you cannot expect to teach them deeply, but the women have been trained to be modest, retiring in manner, and never to come forward except when bidden. One of the tenets of their religion is that they shall never shed blood.

Here is Tokio, the greatest city of Japan. Here is roof after roof and all securely fastened, for when the earthquake comes it is liable to shake half the city down.

Here is the agricultural building in Tokio. It is kept by the

agricultural department of the government, which shows that they are well up in architecture, and can build beautiful houses. It shows that they have been earnest and active in finding out what other nations have been doing. They send their best statesmen out into the world to gather up information. Then they think it all over, talk it all over, always improve upon it and work it out in their own way.

In the springtime you must go out of doors to appreciate Japan. Here is Tokio in cherry time. Their cherry trees bear no fruit, but they have wonderfully beautiful blossoms. Here is a street planted with cherry trees. You get an idea of some of the parks in Tokio in cherry time. The cherry blossoms in Japan are three or four times as large as our cherry blossoms.

Here are the cherry trees in full bloom in the country, and it gives you an idea of a country road. Look around you in this delightful country and you will find a pleasant landscape on every side. In some of the gardens of Tokio, you will find the gardener to be an artist. Here is one of the ways in which the gardener seeks to make a surprise for his friends. Here is an ornamental figure made out of morning-glories, and you will find images of numerous wild boars and lions, and human beings in different postures, all made out of flowers. I need not enumerate the beautiful flowers which we have imported from Japan, the chrysanthemum, the rose, the peony and others.

Some of the ladies, especially of the upper class, have to take up floriculture as a part of their education. They have to learn especially about flowers for decorating purposes. Their idea of beauty in floriculture is not one great mass, a great wreath or pillow of flowers made up of all colors, but if they want to illustrate the very acme of beauty they take one little flower, perhaps a lily of the valley, with its one leaf, and place it in a little vase, which is well adapted to receive it, and this will be the only ornament in the room. They do not try to mass blossoms in a great bouquet as do we. The longer I lived among this people the more I believed they had the right idea of floral art. If you wish to appreciate the true beauty of flowers, you do not want a

hundred of them all jumbled together, but one in its simplicity. This gives you the best idea.

I spoke a while ago of the geographical nature of Japan. You see that it must have an immense coast line, which gives it an opportunity for a large fishing business. Thousands upon thousands of the Japanese are engaged in the fisheries. The laboring class live almost entirely out of doors in the summer-time, and that is, I think, one reason why they are so healthy. If you were there on a holiday, you would find all ages and sizes out in the streets and public gardens. Here is a coolie or a man who works in the warehouses or stores. He has upon his back a character which designates his position in the store. Here is a man wearing a native dress and having an American hat upon his head. They are trying to adopt civilized costumes, as we call them, and they are many of them doing it by halves.

The people love to get out of doors. They love gala days and festivals. This is evidently one of their festivals. Here is a ceremony of a different nature. It is a funeral. The priests at the head are reading in the rites that take place at a Buddhist funeral. Those on the left are the mourners. This is the inside of one of their temples. This funeral is at the cemetery. The coffin is a large white box. The Japanese does not lie in the coffin but sits in it, and the coffin is usually white. These ladies dressed in white are mourners. The mourning costume is almost always white, not black like ours. It is a custom which I think is ahead of ours. It seems to me that it is the right color, if you propose to have a peculiar color for so sad a time.

We will go away from this capital city of Tokio towards the city of Nikko. As you journey from Tokio you can go on foot or be carried in a jinrikisha, or you can go by rail. If you wish to see the country you will go on foot. You will find by the roadside occasionally a tea-house. Here is one. The Japanese loves to rest and he does not go far in a day. The tea-houses are scattered at intervals along the road so that the traveller can stop and rest. He sits down and while he is resting the tea is brought to him. He rests perhaps for fifteen minutes or a half-hour and then goes on to the next tea-house. These are very

beautiful resting places. The people are polite and kind and it costs very little to stop at one of them. A foreigner going to Japan for the first time should stop at one of these places if he wishes to study the customs of the common people.

They have beautiful roads in Japan, roads that have been in use hundreds and hundreds of years.

Here is a Japanese maiden with her usual burden. When a baby is born it is almost immediately put upon the back of the grandmother. Then if another little tot comes along it is placed upon the back of the first child, and so, in passing through a Japanese village, wherever there are two feet there are two heads. It is rather bewildering. If there is no girl to carry the baby, then it is tied to the boy, and if there is no boy it is strapped upon the back of the grandparent, the first upon the grandmother and the next upon the grandfather. If there are no grandparents, the uncles and aunts are brought into use. This burden does not seem to trouble them at all. The girl here will play as if she had no baby on her back.

There are so many blind people in Japan that many years ago the emperor gave them the exclusive right to shampooing. These blind shampooers made a good living. Their peculiar whistle was one of the most weird and strange sounds that I heard in Japan. I came rather to like the noise of it. The people were very kind to the blind shampooers and they always have the right of way. Somebody will call out to one of them to stop and he will go in and perform the massage movement for anyone who wishes to have his aches and pains taken out of him, and in this way they get a living.

Japan is the only place in the world where you get anything like the color of the American maples in autumn. This is a sort of ambulance on wheels. The lady is in the middle, the men carry it on poles over their shoulders, and the servants walk along beside it. The Americans find it very difficult to ride in these cages, as they call the kagos. It is a good deal like the Turkish way of sitting on the lower limbs.

As you approach the beautiful city of Nikko you see a great many beautiful trees that are something like the Redwood trees

of California. They make the most beautiful groves and forests that I have ever seen. In going to Nikko you see a beautiful bridge. The emperor is supposed to pass over it once a year and no one else is allowed to go over it. Gen. Grant was given permission to pass over it, but he wisely said that although he thanked them for their kindness and courtesy in offering him the opportunity, he would go over by the common bridge. Nikko is very picturesque, it is a city of temples.

Here is a two-wheeled hand-cart or jinrikisha. This man can go forty miles a day and be ready the next day for forty miles more. When you first get into one of these carts you wonder which way it is going to tip. There is something about the motion that makes you laugh. It is a nice way to travel if you like it.

The Japanese claim to trace their ancestry back 2500 years. Their first emperor was supposed to be descended from heaven. It is wonderful indeed to think that they have been a nation as long as that. And they sometimes laugh at us when we pretend to be so much more civilized than they. You find a people who when we try to teach them claim that they were civilized long before we were. They were a civilized people when our ancestors were in the northern part of Europe, dressing in bear skins and living in caves.

On the temples you find decorations illustrating fables which the Japanese mothers tell their children. It is one way of telling the old, old story. The monkey on the left is holding his hand over his ears so as to hear nothing bad; the one in the middle is holding his hands over his eyes so as to see nothing bad; and the one on the right is holding his hands over his mouth so as to never say anything bad. In Nikko at the very top of the mountain is a mausoleum or tomb and shrine where the first Shogun is buried, and that means a good deal to the Japanese. Way back in the thirteenth century the emperor was dethroned by his chief soldier, and for centuries the empire was governed by this chief soldier and his descendants. The real emperor was put into a palace and his descendants were kept there hundreds of years, never appearing before the peo-

ple. When a child was born who was the true emperor of Japan he was allowed to hold the office but always under the control of this Shogun. And when the young man came to years of discretion he was compelled to take upon himself religious orders and become a monk. So the empire passed on to the next in rank and the real emperor was never actually ruler. Until forty years ago he was not allowed to come into power and the nation was really governed by the soldier class. They had a feudal system and the tyrants ruled, the stronger tyrants over-ruling the other tyrants, and making them pay tribute.

Here is a man riding on his little Japanese pony. The servant is at the head of the horse with a bundle of rice on his back. The man is going on a pilgrimage. It is a peculiar custom of the Japanese of the lower class to go on pilgrimages to visit great mountains or shrines, and you will see parties of a dozen or fifteen of them going on foot to visit one of these shrines and pay their vows to their deities, and to pray for good harvests and so forth.

Here is a Japanese dressed in his rain cloak. It is made of rice straw which will shed the rain perfectly, and the hat on his head will keep off either rain or sunshine. Here is a Japanese at work in the field with a *kurra* or bog hoe. It is a very rough implement but it is the implement with which the thousands and thousands of acres of Japan are cultivated. The men will work for a while and then stop for a lunch. They have to eat four or five times a day. Here is a field of rice. Rice is the chief product and the Japanese grow the very best in the world. These farmers alternate between smoking, lunching, and working. If a neighbor comes along they have plenty of time to talk with him.

Here is a Japanese woman going to market. She has her basket filled with cabbages, which she is carrying to special customers. Her basketful is worth two or three cents. She has to carry it a mile or two and sometimes back again, and then comes back the next day with another load.

The "*daikon*," a kind of turnip radish, is the favorite vegetable of the Japanese. One way of preparing it is to pickle it

and put it away in a cask until it becomes so strong that it would drive you out of the house.

Here is a Japanese farmer threshing barley. You notice that this man takes a sheaf of barley and pounds it upon a wooden block. Here is a Japanese girl reading. Her head gear is something enormous. Here are some Japanese wrestlers. They are lusty fellows and although they look very plump and fat it is all muscle. This is one of the greatest amusements. The wrestlers come in, thirty or forty on a side, and as soon as one falls another jumps up to take his place, and so they keep going and coming. The practice of wrestling is hundreds of years old and it is not considered disgraceful to be a wrestler. They often wrestle before the emperor himself.

You can always tell the widows in Japan by their short cropped hair. One of the empresses of Japan, when she took a husband, made a vow that she would abstain from worldly pleasures. She blackened her teeth and pulled out her eyebrows, and this practice became the custom for married women.

Here is the way in which a Japanese woman salutes her friends in parting, and with this in closing I salute you, thanking you for your kind attention.

## 24th February, A. D. 1898.

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# ESSAY

BY

REV. G. W. KENT, WORCESTER.

*Theme:—What the Roses have taught a Minister.*

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*Mr. President, Ladies and Gentlemen:*—It is not only an honor and delight to address you this afternoon, but I feel an inexpressible relief and comfort in times like these, when the air is thick with threats and rumors of war, to turn away from it a little space and talk to you who cherish and cultivate that art which I think you will find through all ages has been the gentle genius of Peace and Good-will. Indeed, do we not know that man first began to turn from his wild, fighting savagery when he settled down and began to cultivate the soil? I hope to find for you this afternoon, as I trace only a single chapter in the art of gardening, the better and gentler meaning which lies, I think, behind the sad secret of man's fierce, selfish, combative nature.

Let me confess at once I know nothing of the technical, practical side of your art of gardening. I hardly know one tree or shrub from another. I feel almost ignorant enough of such things to join the ranks of those who have assailed the devoted and disinterested service which your beloved and honored President has given to the city, only that I have a little sense in my ignorance. I simply look up with wonder and reverence to those fortunate people who have love and genius for gardening, and I realize that there is health, happiness, and profit in it if you only can; I can't, but I can appreciate it in

those who can. Just think of fulfilling the old prophetic vision, comforting earth's waste places, making her desert blossom as the rose, rendering the wilderness like Eden! When one's own wilderness persistently remains a wilderness, and one's little bit of desert refuses to blossom with anything but a few good-natured dandelions, one can appreciate good gardening in others, I can assure you. The fact is I had a garden before I came to Worcester; fortunately I had a good old neighbor, too. I remember I used to toil with exertions that were something frightful. My back used to ache as his never did. I used to read up until I could talk gardening in a way that simply overwhelmed him, and yet my flowers would never grow, at least never to anything but leaves, and my vegetables never came to enough to feed the caterpillars and grubs who forced themselves upon my hospitality. If it had not been for my good neighbor, I should have fared very poorly indeed. What a happy man it made him! I used to envy him a thousand times. He seemed able to forget all frets and weariness and meanness. He was in politics, and in his garden he seemed to find some relief even from the turmoil of politics, and things must be pretty soothing to quiet a man's mind under such circumstances, as our Mr. Walker could assure you. His flowers and vegetables seemed to be so companionable, they never quarrelled, and as you know by your experience, no doubt, they reward the least attention and kindness a hundredfold and more. Being an ignoramus myself, as to the technique of the art, I have had to content myself with what is really the minister's main business—the study of relations. Let me show you what I mean. The manufacturer, the merchant, the mechanic, knows immeasurably more about the way, the technique, the process, the pushing of his business than I do. The mechanic knows about his tools, and has a skill to use them in a way that fills me with wonder and despair. The farmer knows more about crops and cattle and soil in half an hour than I am afraid I shall in all my life. Even the liquor dealer knows how to work that miracle, how to make ten-year-old whiskey in ten minutes in a fashion that I should never dream of. But

there are certain large relations of each man's business to the world's business, to society, to human welfare; and no man knows so little of those large relations of his business to what is right and true, as the man immersed in his own business. He is like the engineer down in the hold of the great ship; he can make the thing go, but to pilot it up on deck, to see where the thing is going, is beyond his power.

There are great meanings flashing out all the time from the farmer's craft, out of the mechanic's handiwork; great revelations of truth showing our relation to human life, to the whole universe, which, I think, it is the minister's business to be looking up all the time. There are bright revealings that I can trace amid the daily toil of you business men, great shinings out of honor and mutual trust, revelations of hope and promise, showing me the way of God. I was always intensely interested in these larger relations of things, about the technical merits of which I might know nothing.

When I was a boy in England, there lived almost next-door neighbor to us a very learned naturalist and scientist, one who has written a number of books which to a wonderful degree explain the great problems and secrets of science to beginners, Mr. Clodd. Many of you have read many of his books. And it was just at the time, that is when I was a boy, when science was turning from the endless business of labelling, cataloguing and classifying all the different species to the immensely better business, it strikes me, of reading the meaning of the differences between them. I remember how he used to talk to us children of the beautiful, the wonderful relation of each little flower to its fellow and the great life-history of the world, and that is how I came to find my sermon for today.

If I were to take a text for it, and we ministers can hardly preach a sermon without taking a text, I should, I think, take the old Hebrew prophet's hopeful and happy view of the day to come when "Instead of the thorn shall come up the fir tree and instead of the briar shall come up the myrtle tree." But I think we English children would like the prophet's hoped-for day to be postponed as long as possible. I hardly know what

the English boys and girls would do without the thorn and the briar. The hawthorn and the sweet-briar are England's fragrant and beautiful gifts to the country-folk in all that little land. We hardly find a cottage in all her lanes and byways which has not a bush by its doorway of the sweet-briar. I wonder how many thousands of Englishmen there are scattered about the world, in busy American towns, on Canadian farms and Australian sheep-ranches, and in Indian cotton-fields and African gold-mines, who, if across their pathway were to come the fragrance of the sweet-briar, would be carried back, as a perfume will carry one back, to the scenes of boyhood; loved and cherished scenes of the little cottage and the mother's ways about the house. Then the hawthorn;—I suppose there was not a boy or girl who did not go Maying, which was, as is meant there still, to go after the white and fragrant blossoms of the May or English hawthorn. And what scratching of hands and tearing of clothes it meant, too!

You are more or less familiar with the hawthorn, and have seen great bushes, even trees of the cultivated variety, growing up about our city. It forms those green hedges that separate the fields and farms and roads in the place of fences and add so much beauty to the English landscape. Let me say that the hawthorn hedges almost invariably, in the moist, mild English climate, grow a wall of green to the very ground; its white flowers are the joy of the bees, the butterflies and the children, and its red fruit, or haws as we used to call them, are equally the joy of the birds in the winter-time and the hungry children at all times. Its thorns make it a farmer's hedge which no cattle will try twice to penetrate.

I can remember no happier experience than when the spring-time came (and in my part of England, down in the South, it is beginning to come already), and the days grew longer, and the air sweet and warm, and the hedge-rows blossomed, going after the May and coming back all scratched and torn, but bearing triumphantly great masses of the fragrant blossoms. I wish I could transport you to an English country-side in an English spring, so fragrant and so musical. It seems to me, —

it may be a bit of prejudice, however I notice John Burroughs repeats the heresy,—that our birds sing more in England than here. It may be that multiplied centuries of the companionship of men have made the birds more tame than here, where we have not a thickly populated country yet. Then the wild flowers, in that moist, warm climate are more abundant among the hedge-rows that meet the sight everywhere. But the joy of going Maying I know was just in the going after all. And it is an old, old, wonderful story, this Maying. It leads to what I want to say to you this afternoon. The English children are late comers at it. Why long, long ago, before there was an English child, or any human child, the bees and the butterflies and the tiny creatures of the air, went a-maying.

The blossoms and the insects, as of course many of you know, grew up here together in the great process of creation. Where we find no trace of the birds or butterflies, there we find no trace of plants that blossom and fill the air with fragrance and brightness. We find instead tokens of a great rank, blossomless, colorless vegetation; and you know the familiar story which Mr. Darwin tells us so eloquently in one of his books, upon the fertilization of the plants by means of the insects, who take their pay in honey. He tells us how the blossoms and the colors of the flower make the plant's advertisement, "Honey here!" and for that simplest little service it offers that sweet reward.

The first human children and their mothers and fathers found the flowers here; of that we are pretty certain nowadays. And what is all this talk of endless competition in the world, so hard and selfish? Why, it has been a matter of mutual helpfulness and co-operation from the start. I know of no better illustration of it than the way in which the bees, the butterflies, and the blooming plants have grown up together, owing everything to one another's mutual love. The hawthorn flower and the hawthorn fruit are full of meaning, more than I can tell you in the time you can allow me.

I dare say you have seen the little fruit of the hawthorn. The way we children used to cull it and love it! I remember

a summer or two ago as I took a walk from Stratford to Shottery by the same path across the fields that the young Will Shakespeare took when he went, his young heart beating high with hope and love, to woo and win Ann Hathaway. I remember that the walk was by a hedge all red with the little fruit of the hawthorn. I got my pockets full to bring back with me to America but I don't know what became of them; I am afraid that boyhood's habit asserted itself and I must have eaten them unconsciously.

I remember the delight of the discovery made by me from a hint of Mr. Clodd's, that the hawthorn and the rose and the apple and the strawberry are all sisters of one family, all roses. I can recall yet my childish delight in tracing the family relationship. About the only particular in which it can be traced is in the five petals of the flowers of the wild rose, the apple, the strawberry, and the hawthorn.

The roses and the birds grew up together in the great process of creation, and there we have a bit of that Altruistic co-operation rather than fierce competition in nature. The birds wanted food and the roses wanted their seeds scattered, so the roses enclosed their seed in a hard, indigestible covering or shell and then put about it a soft, attractive pulp so that the birds in feeding themselves would at the same time help the roses to scatter their seed. And you notice how ingenious the rose is, whether it be the apple or strawberry or what not. How cleverly it keeps its fruit green until the seeds are ready, so as to be unobserved by the birds, and keeps it sour, so as to be unattractive to them! And then how those sisters vary in the way in which they set the seed in or about the swelling of the stem that makes what we denominate the fruit. The strawberry, with its luscious swelling of the stem, and the seeds like tiny nuts scattered on the surface; the rose and haw, with their swelling of the stem, and the seed inside of the fruit, as it is too with the apple. Then again mark the difference:—where the rose has plenty of seeds to spare, as in the strawberry, raspberry or apple, the seed is not very carefully protected; but when there is only one to each fruit what a hard shell, as

in the peach, is put about that single seed to save its life. The raspberry, differing from the strawberry, has its seed inside of each luscious globe of fruit, and this fruit can be pulled off the stem, while the blackberry, you notice, has its seeds covered in the same way but its fruit is fastened to the stem.

The progress of the rose family is a recent matter, just as the fruit-eating birds are recent. The primitive birds were carniverous altogether. The later more graceful and attractive ones are fruit-eating, and practically they all came in together with the Tertiary epoch. We find their earliest remains in earth so recent that as yet it has not hardened into rock or stone. May I not fairly say here of this rose family that in it we have one of the noblest families from our point of view in the whole vegetable world. It is a family that has grown up together with man, and it has given him some of his best friends, good friends to cheer the sight of his eyes and delight his sense of smell and to satisfy his hunger. It has raised him up the apple, pear, plum, peach, almond, blackberry, strawberry, raspberry, and dewberry,—and I dare say I have left out some. Think of the leafy shade, of the radiant bloom, of the sweet scenting of the air, and the luscious fruit these different sisters of the one family have produced for him. And all from some primitive, colorless, scentless, flavorless rose that probably we would not recognize to be a rose at all.

But, then, if we are to think of the foliage and the flowers and the fruit we also have got to think of the thorn and the briar. The hawthorn and the crab-apple with their angry teeth, and the blackberry and the rose with their spiteful thorns. Well, how did such things come? There is a problem that I want you to meet with me this afternoon. We have one of men's earliest ideas of how thorns and prickles came, preserved to us in the venerable old book of the Bible, the book of Genesis. It is that they came as the curse of God on man for Adam's disobedience. "Cursed is the ground for thy sake, in sorrow shalt thou eat of it all the days of thy life. Thorns also and thistles shall it bear unto thee." Well, when men imagined such an origin for the thorns as that they had not yet

learned the secret of them, that is all. Let us read the later solution. We have to-day I am told,—I do not know anything about it, but so I am told,—we have over two thousand varieties of that wholesome, delicious fruit, the apple. Two hundred years ago there were less than one hundred varieties, and when we go so far back as the time of the Romans, while they had the apple and the pear, from Pliny's description of them, Mr. Darwin concludes that they were a fruit so sour and hard that today we would not tolerate them. When you go back to Adam's day the apple was nothing but a bush of savage thorns, and the fruit was so sour and hard that the old tradition that Eve tempted Adam with an apple is put out of court entirely. It would have offered no temptation, the first bite would have been enough. I doubt if he could have bitten the thing even.

The deepest meaning of that thorny bush was hidden yet. The book of Genesis says that thorns came as a curse to man. The difficulty is with that idea, that as a matter of fact we find the remains of tooth, claw, talon, beak, spine, and poisonous fang ages upon ages before a human being trod the earth. We can hardly blame man for it all, for he proves an alibi, he wasn't here. But more suggestive is our discovery that thorns at least were not original creations at all. They were simply twigs which for the time being had more important business to attend to, and had given up the function of bearing leaf, flower, fruit, and had developed sharpness. They did this purely as defenders of the mother plant. Plant life originally,—for we find the plants and so know what we are talking about,—in those early times when the earth's atmosphere was hot and humid, and the air was charged with carbonic acid gas, as it is not today, plant life was of a rank, weedy, spongy sort. It was soft, and as soon as animal life could be supported at all it was devoured by those huge "Dragons of the Prime." Now many of the juicier, softer, sweeter plants, of course, were rendered entirely extinct, feeding those great creatures which made the beginning of animal life upon the earth. Those few that chanced to be hardest and least palatable survived to pass

on to the next generation. So by this law which Mr. Darwin has so completely explained, this law of the survival of the fittest, those plants which developed hardness survived in the great processes of creation.

This "Survival of the Fittest," just as when the gardener prunes off and digs out what he does not want to grow and thrive, cultivated the hard, strong, inedible plants.

Now let us turn, having in view that process, having in mind that earliest way of gardening before man was here to do it, to the primitive mother rose. Of course, her main business in life, for her life depended upon it, was to save herself and her little ones, her seed, from being devoured by some huge Mastodon or Mammoth, and to this end, by that same process of the "Survival of the Fittest" she raised a standing army 100,000 strong; her twigs gave up the function of bearing fruit and took up defensive measures, became sharp and drove off the huge creatures which would have made short work of the mother plant. But for the thorns we would have, today, no rose nor strawberry nor peach nor any of those other delicious plants of the rose family.

But the best remains to be told, and it is a little like the story of our citizen soldiers, the story that we are ready to duplicate today if need be. You remember how it happened thirty years or more ago. Men of peace they were, those men of Massachusetts and New Hampshire, of New England, and all the North, men of peace they were; but when the country cried out to them for help, when the Union was in danger, then those men of peace who hated war, who knew the joys of home life, who loved the little ones and the wife, and clung to the prosperity and the comforts of a peaceful home, those men of peace laid aside their instruments of peace, took weapons in their hands, and went forth to kill and to be killed, if need be. We know the noble story of what they did, that as they went 100,000 strong from here up North, they went singing, "We are coming, Father Abraham." They were going, if need be, to death itself. But when the war was over, when the Union was saved and the slaves free, then these same men who had

tasted the fierce delight of war, when the need of war was ended, came back to home and shop and farm again, took up their instruments of busy toil, and became once more the men of peace they had been. That, to my mind, is the noblest part of the story of our soldiers. That is precisely what the thorns have done.

Take the beginnings of our apple tree, of our Baldwin, our Pippin, our Gravenstein, without a thorn from stem to farthest twig. They had their beginnings in that hard, stumpy, thorny, savage crab-bush. Man took the thing, hunger compelled him to eat its fruit, and he found that with proper care it began to take on sweetness and harmlessness. He protected it, and gave it nourishment and sunshine, and so the long process went on until we have our wonderful varieties of apple, peach and plum today. In England, I remember we boys used to go after what we called "sloes" in the later summer-time. What fun it was! But what anguish both at the time and generally afterwards! They were a species of wild plum, but it was growing into tameness. You could eat the thing, and such disastrous results as I have hinted at would be pretty sure to follow. But the wonder of it to us was that on that wild plant we would find innumerable thorns which were giving up their soldier life, and out of each side of these thorns would be tiny little leaves, and the fierce sharpness of them was disappearing. They were turning back to twigs again. And that is the process that has gone on with the apple and peach and cherry, all those delicious fruits. You know how we cultivate the hawthorn, which makes such a thorny hedge in England. We can cultivate it out of thorniness. We have varieties of roses already in which the thorns have been cultivated out. We have given all our attention alone to producing fragrance and beauty in the rose and have neglected that particular, letting the thorns come on them, but if we wish, in less than a hundred years, we can have our roses without thorns.

All this is of vital interest to me as minister, in a different way than it is to you, as horticulturists. The glorious conviction comes to me that the thorns of human character, the hard,

savage, sour, unlovely elements of human nature came about by the same divine process of creation, and are to be turned to sweetness, fragrance and beauty, in the same glorious and blessed process. The ferocity of man, the selfishness of man, the fierce self-assertiveness of man, came in answer to the same demand, in answer to the same environing conditions. Those thorns will all be changed to branches of peace, bearing fragrance and fruitful bloom of kindliness, generosity and love. There we have the secret of the great sore puzzle of man's selfishness and hardness. Let the rose interpret the problem for us.

The baser side of human nature came in answer to the necessity that he plant himself, first of all, firmly and tenaciously as a creature of the earth, just as the old wild rose had to do; to root himself deeply in that soil upon which he must live and out of which he must be able to wrest a living. The physical man had to be first a wild, fierce animal in order that by and by he could grow to be a nobler man. The fact is that strong, fierce self-assertiveness, at that time, was the law and condition of his survival. He came into a world of savage beasts; he came into a world where he had to fight cold, storm and hunger. No armor-plate for his protection, no speed like that of the horse, no strength like that of the lion and elephant, and he had to put in its place strength of brain, to have cunning, obstinacy, fierce self-assertiveness, tremendous masterfulness. Man had to look after number one or else some lion or tiger would have been the foremost creature of the earth. He had to assert himself, to resent injury, to establish himself, as I have said, with strong passions and strength of will. He became as hard and savage and thorny and unassailable as that first crab-bush. He became all that, not merely passively as the crab-bush did, but he became it aggressively and made himself master of every creature in the world. There followed from that a result of vast, of sacred significance. Thus he won dominion over the creatures of the earth. Thus he secured freedom, leisure and opportunity to rise out of these animal beginnings to something finer and nobler. These passions of the wild beast rose to

nobler ends. This resentfulness, resentfulness at first of mere attack upon himself, became a resentfulness of injury to others and hatred of injustice and oppression. This strength of will became a will for righteousness.

Thus in that old conflict there was wrought out that steel-like temper of character, that iron will, that force of soul, which God wanted in his making of a man. We see it yet in a Luther, a Paul, a Jesus Christ, men with capacity for holy anger, men who could fight, fight a life and death battle if need be. Now, in our own day, I think there dawns at last the time of our divine completing. Take this old, fierce, wild passion and assertiveness, and sweeten and sanctify it, leaving all the splendid strength of old, but putting it to holier uses; glorify the old skill, by leading it out of cunning into wisdom and generosity; make god-like the old strenuousness, by making it instead of self-assertive a mighty will for righteousness and others' welfare, and you will render this King of Beasts the King of Souls. That is the task the roses teach me. It is no easy one. Still there is the old need of self-defense and self-assertion. I do not wonder that the old selfishness survives, that men still look out for number one, that still they practice cunning. We have to root ourselves as firmly as ever in this old mother earth of ours. We have the same old cold and storm and hunger to do battle with; and still there is a need of splendid wrath against oppressive cruelty, against cowardly infamy whenever we find it. I think we still ought to know how to fight, if fighting is to be done. With Thomas Hughes, I am dead against crying "Peace!" when there is no peace, and is not meant to be any. But better than that, I think, is the great task to-day of learning to be master of the old Adam. There is nothing to be destroyed. Remember the vision of the old prophet that "instead of the thorn will come up the fir tree, and instead of the brair will come up the myrtle tree."

We have a happier sight than that old prophetic vision. We have the thorns and briars not exterminated, but bearing leaf and flower and fruit, turning back to twig and leafy branch again; and that is better than exterminating the old briar and

thorn. We have the very sight before our eyes of such God's work going on. The old man, harsh, fierce, selfish, savage, is not to be destroyed, not destroyed at all, no element of his power is to be wiped away. But out of the old man, strong, stern and fierce, the new man is to grow. The strong, stern, unlovely elements becoming the strength of holiness, the stainlessness of purity, the perfectness of love. That is the lesson, which in utter ignorance of the things themselves, the roses have taught this minister.

## DISCUSSION.

### Mr. Harrison.

*Mr. Chairman and Friends:—*

I have been highly delighted with these remarks this afternoon. I am intensely interested in the subject. I believe in the mission of beauty, in its power to help humanity; and as has been outlined, beauty was unfelt in its loveliness on earth at the time of the advent of humanity. The vegetation of the carboniferous age was not beautiful, it was left for the goal of man to make beauty rise on every hand. We are told by mineralogists that even the diamond and the sapphire are comparatively recent productions.

In the West where I have been so long, I have rejoiced in the evangel of nature, that beautiful evangel which reveals God's infinite love. "The wilderness shall blossom as the rose." Out there in the wilderness the rose has its mission. There is a man on this great prairie who not only chews tobacco, but eats it, and it is hard to tell where the plug leaves off and the man begins; he becomes the plug himself. I have seen him go to the store to sell his wife's butter and eggs, and get fifty cents for them from the grocer. He would then buy forty cents worth of tobacco, and ten cents worth of sugar for his wife and take it home and eat three-fourths of that himself. Now when you come to bring him into contact with a higher civilization, and under the influence of beauty you make a different man of him. You cannot save the old man, but you can the boys, and wonderfully assist the girls.

I have been impressed in going by some of those sod houses to see the "Survival of the Fittest," to see that some of the women have retained the home love for flowers. I remember one lady's house, in particular, which was called the "brownstone front," where the most charming flowers used to grow. We used to drive out of our way to go past her house, and take in the marvellous contrast between that sod house and that beautiful bed of flowers. There is something taking in flowers.

Several years ago a gentleman travelling through the Rockies fell in with a rough sort of a fellow and was afraid of him. But they climbed up to a summit and there was revealed one of those beautiful perspectives, valley, mountain, and plain. His companion stood absolutely entranced and looked upon it. And the man said, "Then I dropped all apprehension, my friend, of that fellow. The man that appreciated beauty was, I knew, a safe man." Beauty is the alphabet of the revelation of the hereafter. The mission of the beautiful is to make us better, and to teach us of the hereafter.

I remember a beautiful little child in Minnesota. She came to lie down and die with the dread diphtheria, and there came to her a vision of beauty. She told her friends of the wonderful farm through which she passed. It was so lovely and there were such flowers there! Then I thought of the sweet fields beyond, the swelling fruit, the never-withering flowers. I remember during the great exposition I was lying at the point of death with the rheumatic fever, and thought I was going over to the Border-land. It seemed as though the way was very open and plain. I remember one night there came such a vision of splendor as I never dreamt of. My friends were all at the Chicago Exposition and they sent home a letter with regard to the splendor and beauty of that wonderful exposition, but it could not compare with the beauty of my dream. I thought I saw a vast field of unspeakable splendor, with chrysanthemums towering up like trees, all one blaze of beauty. There were roses in vast varieties, and flowers such as I never saw before! Well, he is able to do abundantly more than we can ask for.

These things make us better. They are God's evangel of beauty, and therefore the horticulturist has a wonderful honor conferred upon him, for the lover of flowers is brought nearer to the love of the infinite and the beauty of the Lord is upon him.

I am very glad to meet you; I am glad to have a chance to say a word, and exceeding glad to hear our brother here, the minister, tell of the wonderful opportunity for growth. All these things belong to us; they are our heritage; we claim them as our right.

Out in Kingfisher County, Oklahoma, we are starting a college and we want to have a horticultural department. I believe the better way to do is to encourage them, to let them realize what can be accomplished. The girl is very nearly related to the beauty of her flowers; you can hardly tell where one leaves off and the other begins. What we want is to teach the girls of the West that they can wield the wand of the magician, and clothe the prairie with beauty.

### Mr. Record.

I have listened with a good deal of interest, and if I had power to convey my ideas I would make some remarks, but I would simply say that I have failed in my efforts in the past to see that process of development that had been expounded to us in nature. I had rather fall back on the religion which we have given us in the Scriptures, and which, I think, no science has yet, or ever will, entirely upset. They may at first seem to contradict, and I think that even Mr. Darwin has got on some wrong tracks. Our brother has not told yet in just what form the flower or rose started, but has given us to understand that by reason of its hard surroundings it was obliged to put out these organs of self-defence. I do not know but man by reason of his hard surroundings has been obliged to put out this very perverse nature which we see working all through the world, still I believe that the final regeneration of man will come about in some other way than by merely cultivating that which is in us. I believe that Jesus Christ said, "Ye must be born again,"

or, in other words, "born from above." I believe that I shall not be developed from without.

We have civilization, we have a wonderful development of horticulture, manufactories, science, and political art; but what are they? We are the peers, in some respects, of the savages of ages gone by; and yet when we look at the strength of the efforts that we have made in our political affairs, it has sometimes seemed to me, it is the same barbarism refined, for we have as hard a time to fight our fellow-men as the savages did themselves.

If I had more time, I would like to say something on the war question. While the thought expressed in the lecture was very beautiful, and some of the ideas, yet as far as the ethical part is concerned, I should certainly take some decided exceptions.

### Mr. Knight.

I was reminded of a story of Mr. Lincoln, which I think has never been published, and yet, undoubtedly, it is true. Some years ago I was on a business trip in New Hampshire. I met an old gentleman at Whitefield. He had been one of the leading men of Whitefield, and one of the active men during the war, and with two or three others from New Hampshire was in Washington looking after the New Hampshire troops. They had finished their business and were ready to start for home when one suggested that they call on Mr. Lincoln, perhaps they could say something to cheer him up in the midst of his care. They went and were met at the door by an orderly, they told him who they were and what they came for. He said, "I will speak to Mr. Lincoln, possibly he will see you." He came right out and said, "Mr. Lincoln will see you now." They were ushered into the presence of President Lincoln. He received them very cordially as gentlemen from New Hampshire, and invited them to take seats. He said, "A pretty, fine country you have there in New Hampshire, I think. I was out that way some years ago, and the cars stopped and I went to look out the car window. I saw a bumble-bee hanging on a thistle." This was, of course, a pretty keen satire on New

Hampshire. I have made, you see, a thorough study of the question.

Allusions have been made, and properly, to our sisters in the cultivation of flowers and the fine arts. I used to notice on the mountains of New Hampshire a red house or hut, and then if I looked carefully I would see a plot of flowers at the window or door, showing that someone of refinement lived there and had a home there in those barren, bleak mountains.

Our friend from the West, I should know by his breezy style had been out on those great prairies. I was in Kansas ten years ago last summer from the early spring until the latter part of July. By the first of July there came on one of those droughts that dry up every green thing. I saw thousands of acres of great rank grass, such grass as I had never seen before, go out of sight practically in two or three weeks. And what is this I see on the part of the ladies, who have a plot of flowers in their front yards? When the thermometer was up to a hundred or a hundred and ten degrees, two or three hours in the forenoon and two or three hours in the afternoon, they stand over their flower beds soaking and soaking them, trying to save their flowers. Some of the flowers died but many of them lived. Yet if it had not been for the patience of those Western women the flowers would have faded and the grass withered and dried up. I do not care to take up the theological side of it today. As I look at it, whatever God has created in this world, at the outset he has made it a perfect work. I have no doubt that the first man and the first woman that appeared in this world were perfect specimens morally and physically. And so with every plant and every leaf that we put under a glass we see that its outline is perfect; and I do not believe, I cannot believe, in this theory of evolution, that man came from an ape or monkey, and the flowers and the fruit came up from the crudest forms. I do not see it in that way, and I have no doubt, as our friend has alluded to the fruit with which, according to the Bible records, Eve tempted Adam, that it was very fair to look upon. I accept that record as true. I hope in the consideration of this question we shall fall back upon that which

seems reasonable, which seems to be sensible. God never made any blunders in his work. It has been man's blunders that have led us into trouble, and his selfish and crabbed nature.

The main thing for us to do my friends in this world is to make it better, happier, and purer in every way, and so let us come to the fountain of all love and learn what we may. I told you that while apparently every day brings something, yet it has not come true, for there have gone out in the ages past wonderful developments of science and art. I will not prolong these remarks only to say that we do not know what science is going to develop tomorrow. So far it has not upset the record so far as I know, and I do not believe they ever will.

### Mr. O. B. Hadwen.

I have been exceedingly interested in the lecture. I believe nature has been wonderfully assisted by man. From the sweet-briar of English origin we have thousands of the most beautiful roses. It has been brought about by hybridization, and by the progress that has been made in the past. We can hardly measure the progress to be made in the future. The English hawthorn has a great variety of colors.

No one shall foresee or foretell what we shall raise a hundred years hence. Fifty or sixty years ago there were very few roses that I recollect, and I had an opportunity of knowing something of them, and today we have such a wonderful variety. There is not a land on the face of the earth that is equal to England for growing the rose. We have in this country Newport, which approaches England in its climatic condition.

3d March, A. D. 1898.

# ESSAY

BY

EDWARD W. BREED, Clinton, Mass.

*Theme:—Water Gardening.*

The subject of Water Gardening that we are to consider this afternoon is a most ancient as well as neglected branch of horticulture. It has a history contemporary with ancient Egypt.

The sacred Lotus of the ancients seemed to occupy the foremost place in aquatics; for sculptured representations of it abound in Egyptian temples, proving the veneration paid to it. The worship was by no means confined to the ancient Egyptians; for in India, Tibet, China, and Japan the plant was considered sacred and is still employed in regular ceremonies. Homer and other poets have sung its praises. Herodotus, Strabo, and ancient writers have referred to it. In literature, architecture, and culture it held a prominent position. Egyptian monuments bear representations of the Lotus and Nymphæa. The sacred Lotus is not now found in Egypt; but two varieties of Nymphæas or Water Lilies, Nymphæa Lotus called the White Lotus, and Nymphæa Lotus cærulea, the blue lotus, abound. Drops of water on the leaves of the ancient or sacred lotus, Nelumbium Speciosum, look like molten silver and quickly roll off. The Hindoos have a proverb founded on this peculiarity of the leaves, to the effect that the good and virtuous man is not enslaved by passion nor polluted by vice; for though he may be immersed in the waters of temptation, yet, like a lotus leaf, he will rise uninjured by them. The spiral fibres which abound in the leaf-stalks are carefully extracted and used as wicks to

burn in the temples of India before idols. The root-stock and seeds are eaten as food in China, India, and Australia, and medicinal qualities are assigned to the leaf-stalks.

Ancient as the knowledge of aquatics is, the adaptability of them for general culture is a recent acquirement. What is our native Nymphæa odorata, or common white pond lily, was introduced into England in 1786, although an English species, Nymphæa alba, was known there long before.

Many countries have their native lilies varying in color, size, and appearance. Nearly all have an aromatic, delicate, and pleasing odor. In some of the varieties, the flowers rest on the water, while in others they stand above it.

It may seem useless to some to go so far back into the past concerning the subject in hand, but the more we know of the history and native habitat of any plant the more we will be interested in ministering to its natural requirements.

In every advance movement in the world's history there is always some great leader who has a desire to better existing affairs, and to contribute to the world the results of his ambition. Thus was it true in a marked degree with Mons. B. Latour Marliac, the eminent French horticulturist; with an inborn desire for horticultural work he was a passionate admirer of all the beauties of the garden, and the flora of the waters was his favorite study. In 1879, he commenced his efforts in hybridization, which were not rewarded with success at the start, but later developments, based upon the lessons thus learned, brought forth successful results.

Nymphæa Marliacea Chromatella was one of his earliest achievements and is today the standard yellow variety. Our native Cape Cod Pond Lily, Nymphea odorata rosea, afforded him a rich source of pleasure in his hybridization efforts, for it became the progenitor of many valuable varieties. His happy and prolific experiments in the hybridizing of Nymphæa have given great pleasure to the horticultural world, who owe him a debt of gratitude for these additions to our hardy garden flora, which have both the large and noble forms and the soft and lovely flowers of the Tropical Water Lilies.

Among those who have been instrumental in improving lilies and popularizing water gardening in our own country, mention should be made of Mr. Sturtevant of Bordentown, New Jersey, who has been styled the Father of Water Lily Culture in America. A superb variety with bright, rosy red flowers bears his name. In 1839, R. Buist began his devotion to lily culture and was another pioneer. Not until 1883 did water gardening gain any prominence. In 1886 it began to be a feature in the Philadelphia Parks. In 1888, Mr. Goodell of Dwight, Mass., exhibited aquatic flowers at the Massachusetts Horticultural Society rooms in Boston which excited enthusiasm. Mr. S. C. Nash of Clifton, N. J., transformed four acres that produced a rank growth of weeds, muskrats, and mosquitoes into a pond of marvellous beauty, rich in its flora of water plants. The names of Tricker, Gray, Bryden, Blomberg and others might be enumerated as contributing their share in the advancement of "Water Gardening."

If we are fortunate enough to have a natural pond its location is made and it falls upon us to develop nature, but if we have to construct a pond then it becomes our duty to imitate nature. The ideal spot is one sheltered from the cold winds, having a bank on the north side that can be appropriately planted and trees in the background. If our location is on a level plot then we must produce the above effect by planting.

A location for a pond must be secured where the sun will shine on it the greater part of the day. The water must be available and controllable so that the height of it can be raised or lowered at pleasure. If it should be a stream with a strong current a way would have to be provided for the water to run after the pond was full. Water containing salt, lime or iron is not suitable to grow plants in.

The water should not be changed often for it reduces the temperature and in still waters plants receive more available plant food from decomposing insects and organic matter. When it becomes necessary for any cause to change the water while the lilies are in the pond, it should be done on a cloudy day. At first the water should be but six inches deep, it being

shallow it will heat rapidly, but as the plants grow the depth of water should be gradually increased until 18 inches is reached, for some varieties require this amount while others need but a foot.

It is a curious fact that whatever may be the depth of water, the leaves will float and the stems seem to be just the right length, be it six or sixteen inches. In a natural pond a clay bottom is desirable and the soil necessary to grow the plants in should be very rich. If it is to be made it should consist of good turfy loam two parts and old cow manure one part. If the latter is not available sheep manure may be substituted; but instead of the above proportion it should be one of the sheep manure to six or eight parts loam.

Bone flour can be used in addition, a four or five inch potful to a vigorous growing variety and less for smaller ones. It is generally conceded that more flowers are obtained from Lilies by planting them in large boxes or one-half barrels and then placing them in the pond so that the proper height of water will be above them, than by planting them out in the bottom of the pond.

The strong growing varieties of lilies require about six cubic feet of soil, the moderate ones about three cubic feet, while the Nelumbium or Lotus requires about twelve cubic feet per plant. In order to keep the water clear in the pond it is necessary to put two inches of coarse sand or gravel over the surface of the soil.

To make an artificial pond, the shape should be the most natural for the position it occupies. If it can have receding bays and jutting rocky points so much the better. Mr. Olmstead, in an address delivered last summer on the purposes of a park, said, "The water surfaces of a park need more study and care to make them appear natural in outline as to their margins than do the ground surfaces of a park."

Having decided on the shape, it should be staked out and excavated so as to be three feet deep in the centre when done, running up towards the shore, where one foot will be deep enough. The shape will give various depths as required by dif-

ferent plants and allow for eighteen inches of soil in the centre to four inches at the edge. In many soils the bottom can be puddled with clay, which should be thoroughly mixed with water and pounded into place. It will require masonry in some form at the edge, either small stones or bricks laid in cement mortar for a depth sufficient to be secure from frost.

Another method is to place a lot of small stones at the bottom of the pond and extend out as far as the sides, laying the top course in cement mortar, and laying a brick wall one foot high and eight inches thick on the stones at the edge, then all of the surface treated with a coat of Portland cement. A drain should be laid under the brick wall and connected with the sewer or some similar outlet, then no water will remain under the wall and no danger from frost will ensue. Proper attention should be paid both to an inlet and outlet pipe, the latter connecting with the drain under the wall. A pond so constructed will rarely if ever need any repairs.

The whole surface of a pond should not be covered with lilies. If the pond is large, the centre should be kept open and the planting done more at the sides, producing the effect of continuous growth from the border of the pond, and in a measure obliterating the outline of the pond in at least a portion of the way. Walks should be near enough the border to permit the visitor to get a near view of the lilies to fully appreciate their beauty and fragrance. Seats should be so placed that different views can be obtained.

To raise lilies from seed is a very fascinating work. Seed should be sown in February and March in pots of soil with a one-eighth inch covering of sand and placed in a pan of water deep enough to allow the water to stand two or three inches over the pots. The water should be kept at a temperature of at least seventy-five degrees and the seeds will germinate in two or three weeks according to the variety. When the seedlings have made two or three leaves they will require transplanting just as other plants do.

When this operation is done in the water, the roots spread out better and can be easily placed in the pots they are to

occupy. When of sufficient size, pot singly in two and one-half inch pots, then later repot into four inch, not allowing them at any time to become stunted. They will require greenhouse or hot-bed protection until planted out doors in June. All varieties of lilies do not produce seed. Nature therefore resorts to other methods for reproduction. The hardy ones of this class are propagated by dividing the roots as the new growths start in the spring.

The tropical sorts of this class produce side shoots which form tubers at the end of the season's growth. On the approach of frost the roots are taken inside, the foliage trimmed back allowing the tubers to remain on the main root packed in moist sand under the greenhouse benches and kept at a temperature of sixty degrees. In the spring these tubers can be potted and grown until time for planting in the pond, but my advice would be to let somebody else try to winter these tender varieties, as about the only thing you can depend on is that they will rot. Young plants are easily obtained in the spring from men who have facilities for wintering stock plants, and they offer them at a much lower figure than it costs individuals to care for them.

Among all aquatics the Victoria is truly queen, and although it may not become our lot to cultivate it no address on Water Gardening would be complete without considering her majesty. It is a native of South America and was discovered by a traveller nearly a century ago, called there water maize. It is a plant with gigantic leaves five to six feet across, with a flat broad rim five inches wide of a lighter green above and crimson beneath, with beautiful flowers changing from white to pink giving forth a sweet fragrance.

Seed was brought from Bolivia in 1846 in wet clay. The first flower was produced in England in 1849, which was presented to Her Majesty Queen Victoria, in whose honor the plant was named.

The peculiar formation of the leaf gives it great buoyancy, and leaves have been grown in St. Louis and many of the parks that would hold two hundred and fifty pounds weight. The flowers are from fifteen to eighteen inches in diameter, and they

last two nights. A variety from Brazil, called Randii, is of a more robust habit and better adapted to out-door culture. The flowers are white, changing to deep crimson. Mr. Sturtevant, of New Jersey, was probably the first to cultivate this variety here. Mr. Tricker, in 1894, procured a new variety which proves to possess greater blooming qualities than the preceding, and the originator claims that it is destined to supplant its predecessors and make the possibility of Victoria growing of no greater difficulty than that of the tender lilies. In its native country the variety is a perennial, but it is better treated here as an annual. It is propagated from seeds that are sown in February or March and flower the following July and August. It requires one hundred and fifty cubic feet of soil per plant, and the water should be two feet deep. In our climate, when grown out of doors, it is necessary to heat the water to ninety degrees in the early summer, and for this purpose a boiler is placed in a low situation and pipes are run through the pond. The boiler-house should be hidden by rocks, shrubbery and vines. It is also advisable to provide a glass covering until the weather is sufficiently warm. Great care is then needed in properly hardening them off. Victorias have been grown in this State by Mr. Goodell, at Dwight, near Amherst, without heat outside, by using sashes to cover his pond early in the season, and he has succeeded in having them bloom for nearly a month. Mr. Bryden, when he was at Yarmouthport, grew Victorias very successfully, and at one time had a plant which produced fourteen leaves and an abundance of flowers. The expenses incidental to its successful culture render it a plant not for the millions, but for those who have a million or more.

Among the aquatics, the Nelumbium or Lotus, in all its Oriental splendor, is a stately plant, and deserves a prominent position in the Water Garden unless it can be favored with a pond by itself. Lotus ponds are very common in Japan. It is valued by the Chinese, who highly appreciate it, for in North China it is cultivated in every available wet ditch, marsh or swamp. Its seeds and fleshy rhizomes are edible and highly esteemed in Chinese cookery. Its flowers are used for decora-

tive purposes, while its petioles and leaves are devoted to medicine. The Americans, however, are satisfied to use it for its decorative purposes, and in this it excels.

It is propagated by seeds and by the division of its roots. Seeds of the Nelumbium have grown after having been kept forty years, but one may not infer that they improve with age. Baron Von Müller tells us that the ancient Egyptian method of sowing was to enclose the seeds in balls of muddy clay and chaff, which were then sunk in the water where the plants were desired to grow. If the hard, outer coat of the seed is filed thin near the apex, it will germinate more readily. Seed planted in March, in pots in water, at a temperature of seventy degrees, will germinate in about ten days. When the plants are of sufficient size, they should be repotted and kept inside until June, when they can be planted outside in their permanent quarters. The seed may also be planted where the plants are expected to grow, and thus become naturalized. There are some examples of this method that have been very satisfactory. Raised from seed the plants will not flower until the second year, when one may expect a fine display of bloom. If plants are grown from the roots or tubers, flowers can be expected the first season. This method is doubtless best for amateurs. The time for dividing tubers is in the spring when growth begins; the conditions are then more favorable for active work, and little risk attends planting at that time, which will be about June first. When planted, they should be covered with six inches of soil. Once established, they grow with marvelous rapidity.

If planted in a pond with lilies, the roots should be confined by brick wall, as they are voracious feeders and will soon take possession both of soil and space. They attain greater perfection and beauty to occupy a pond alone and without restriction. They can, however, be grown very satisfactorily in tubs and half-hogsheads. They should be in a sheltered spot so that the wind will not destroy their flowers. It is claimed by some that sluggish streams or ponds with a fresh supply of water, either by stream or fountain, are better adapted to them. They should be protected in winter either with water of sufficient depth, or

if the water is drawn off, with a covering of leaves; in either method, enough to exclude frost. The flowers last three days, but unlike the Nymphæa or Water Lily, only partially close at night.

There are about twelve varieties of Lotus, but for amateur use the Speciosum and Roseum are the best. The Speciosum is the world famed Egyptian Lotus, also the Sacred Lotus of the Hindoos, and it is nearly as hardy as the native Water Lily. The flowers are rose-pink, of a brighter shade the first day. They do not fully expand until the second day, when they are at their best. This is a vigorous grower, and after being established, the leaves rise out of the water from two to three feet and the flowers stand up a little above the leaves. The Nelumbium Roseum does not grow as tall as the Speciosum; the flowers are of a deeper rose-pink, and more globular in form. Some cultivators have better success with this variety, but the former is generally considered easier to grow.

Among the other varieties is the Nelumbium Album Grandiflorum, which has pure white flowers that tower well above the stately foliage and contrast well with the bright-colored varieties. Then there is the Nelumbium album striatum, having a large flower with white petals tipped and striped rosy carmine, flowering very freely under liberal culture. It has the fragrance of a magnolia. The Nelumbium Shieoman is a recent introduction of Japanese origin, which claims to be a giant among Nelumbiums, with leaves thirty inches in diameter and stems five feet high. The flowers are white, double, and are produced freely. The Nelumbium Luteum is a native yellow variety and is common South and West.

The Water Lilies are perhaps the leading aquatics for general cultivators, and the sixty varieties which are grown are divided into two classes — the Hardy and the Tender. With proper treatment, the growth and blooming qualities of the Water Lilies are phenomenal; a small plant in the spring, from a three or four inch pot, will sometimes attain a size of from four to six feet in diameter, and will produce a large number of flowers. Instances are known where in the height of the season ten to

twenty flowers are out at one time on a single plant. Of course this means perfection in culture. Cleanliness is essential to secure success, and all flowers, as soon as they fade, as well as any yellow leaves, should be removed. The flowers close up and do not look very unlike the new buds. After you have had a little experience, however, you will easily detect the difference. In the fall, the hardy lilies should receive a natural method of covering,—either a supply of water which should be about eighteen inches deep, so that when ice forms they will not be likely to freeze; or if in an artificial pond, and it is desirable to draw off the water, they should be covered with leaves to an equal or greater depth. It has, however, been proven that some varieties will stand being frozen solid, and not be injured in the least. The hardy varieties can be planted in May, when we see the natural ones making their appearance.

Among the hardy varieties are the Nymphæa Alba Candidissima, Nymphæa Marliacæa Chromatella, Nymphæa Marliacæa Rosea. It is doubtful if a better trio could be named for amateur or professional culture than these three. They are strong growing, free flowering, large and beautiful. No finer variety can head the list than Nymphæa Alba Candidissima, which is now acknowledged to be the best hardy white. It has pure white, large flowers, and blooms from June until frost. Next to this is the Nymphæa Marliacæa Chromatella, having flowers of a canary yellow color with stamens of deep yellow. The leaves are bronzy green with chocolate red markings. It is similar to the preceding in habit. The Nymphæa Marliacæa Rosea is a vigorous grower. It has a deep rose-colored flower with free blooming qualities.

Additions in the new hardy varieties of lilies by the enthusiastic hybridizer are of annual occurrence and show an ever increasing improvement in the shape, size and color of the flowers, which bid fair to equal even the choicest products of the tropics.

In the tender class of lilies are the day-blooming species, whose flowers open early in the morning and close about the middle of the afternoon, and the night-blooming species, whose

flowers open late in the afternoon and close in the morning, although when the weather is cloudy they will remain open longer. The flowers of both species last three days.

As the season for the tender varieties is not of long duration, it is very important that good sized plants should be used when planting; but remember that they are natives of the tropics, and do not plant in the pond before June tenth, and quite frequently it is better to wait a week later. This is imperative. It is as important to have the nights warm as well as the days. If, in parks, electric lights are placed near the pond so that visitors can examine the night-blooming varieties in the evening, the pond will present as beautiful a picture as by day, with even a more fairylike appearance.

The following is a list of the most satisfactory varieties:—

| DAY-BLOOMING. | NIGHT-BLOOMING. |
|---|---|
| Nymphæa Gracilis. | Nymphæa Dentata. |
| Nymphæa Zanzibarensis. | Nymphæa Devoniensis. |
| Nymphæa Zanzibarensis Azurea. | Nymphæa Columbiana. |
| Nymphæa Zanzibarensis Rosea. | |
| Nymphæa Pulcherrima. | |

The Nymphæa Gracilis is a Mexican variety of great merit, being the only white day-blooming tropical variety in cultivation. The white flowers have stamens of rich golden yellow and are borne on stems ten or twelve inches above the water. Its fragrance is like the lily of the valley.

The family of Nymphæa Zanzibarensis is among the most easily cultivated of lilies, producing blooming plants in one hundred days from the planting of the seed. The purple variety has very large flowers and is one of the most beautiful and free flowering of all the water lilies. The other Zanzibar varieties, Azurea, of a lighter color than the preceding, and Rosea, which varies from a light to a deep rose, are easily grown and admirably adapted for tub culture. These two are perhaps the best tender varieties for the amateur to begin with and are inexpensive.

The Nymphæa Pulcherrima is said to surpass in vigor and

free flowering qualities all other varieties, with flowers ten inches in diameter of a beautiful light blue, with deep yellow stamens tipped with blue, and the sepals irregularly striped dark red. The flowers remain open more hours during the day than any other variety. The leaves are large. It is a hybrid of American origin.

The Nymphæa Dentata is the largest and best of the night blooming varieties, with long pointed buds and flowers of a pure paper white thrown well above the water. It blooms freely through the season and is a native of Sierra Leone.

The Nymphæa Devoniensis is a hybrid that was raised by the Duke of Devonshire. It is a free bloomer. Its flowers are of a brilliant rosy red and it makes one of the most gorgeous varieties in cultivation. They are very beautiful by artificial light, and are of large size.

The Nymphæa Columbiana is an introduction of American origin, having bright red flowers that deepen in color each succeeding day. This is an unusual feature in water lilies, as most of the colored sorts have a tendency to grow lighter.

There are many other aquatics that are worthy of a place in the water garden either on account of their graceful foliage or attractive flowers. They should be used, however, in limited quantities, giving the lilies the prominent places.

I shall by no means attempt to give you a complete list, but will confine myself to some of the most desirable. Among the tender plants are the Cyperus Alternifolius, or umbrella grass, which is desirable for edges and is also suitable for pot culture; the Cyperus Papyrus, the ancient Egyptian paper plant, which grows in water or marshy ground and is very valuable in the water garden. It has triangular stalks of from four to five feet in height, supporting at the top a cluster of narrow leaves. It is very effective near the edge in shallow water. It will also flourish and grow in soil with no more water than cannas require to make them do well. Then there is the Eichornia Azurea, or Blue Water Hyacinth, a native of Brazil, and a rapid grower, producing large spikes of lavender blue flowers with a dark blue centre. It branches freely and creeps about

on the surface of the water. Again, the Eichornia Crassipes major, or Water Hyacinth, is a floating plant which forms rosettes of curious leaves. The stems are swollen at the base and contain numerous air cells, causing the plant to float on the water. The flowers are rosy lilac and resemble a spike of the Dutch Hyacinth. The hyacinth should be planted in pots or tubs so that the roots will be confined, otherwise they will overrun everything. This water hyacinth grows and flowers floating on the water, but it will produce better flowers if the roots are in the soil.

As we see this plant growing in small numbers in our ponds or aquatic basins, it is difficult for us to imagine that in the sluggish streams of Florida it flourishes so luxuriantly as to block navigation. So serious a trouble has this become that the Department of Agriculture at Washington has sent an agent to investigate the matter. It has been suggested that to introduce a natural enemy might solve the problem, and the red spider has been considered. If it succeeded, however, it might be found that the remedy was worse than the disease, or perchance, the spider might not take to the water. I do not relate this about the Hyacinth to discourage anyone here, but to show of how easy culture it is under favorable circumstances. It is worthy a place in every collection.

The Limnocharis Humboldtii, or Water Poppy, is so called because of the resemblance of the flowers to the California Poppy. Its flowers are yellow with black stamens. The leaves are small and oval in shape, floating on the top of the water, and the plant grows with great rapidity. It soon begins to flower after planting, and continues until frost a mass of bloom.

Myriophyllum proserpinacoides, or Parrot's Feather, is a graceful, half-hardy aquatic with a feathery foliage, and if placed where it can hang in a fountain basin, produces a pretty sight.

The Sagittaria Japonica Floraplena, or Double-flowered Arrowhead, a hardy variety from Japan with arrowhead foliage and pure white flowers grown on a stalk. It resembles a giant ten weeks' stock, and prefers to be grown in shallow water.

The Zizania Aquatica, or Indian Rice, is an annual and very ornamental. Its graceful panicles are produced on stalks six to eight feet high.

Typha Latifolia, or Common Cat-tail, is too well known to need description, but is none the less effective. Do not allow this to get a very strong foothold if your pond is small, as it will soon monopolize the entire space. It is better to grow this on the border outside of the pond if you have an artificial one, and if kept well watered it will thrive and contribute its valued effect.

The Iris Kempferi, or Japanese Iris, can be planted on the edge of a pond or where it can be occasionally submerged. The flowers are from 6 to 10 inches in diameter and vary from pure white to royal purple in color. This Japanese Iris is one of the handsomest of the whole genus, and when in flower one of the handsomest of all garden perennials. It is beloved by the Japanese, who make holidays to visit the Iris beds when the plants are in flower; a sight which for delicacy of texture and beauty of color is unsurpassed. It is worthy of a place by itself, and ought to receive more attention in the parks and private estates than it does. It is sometimes called a sub-aquatic.

The Acorus Gramineus variegatus, or variegated Sweet Flag, has green and white striped leaves, and is capable of making an attractive feature.

The Lobelia Cardinalis, or Cardinal flower, prized for its most beautiful of all colors, thrives well near the edge of a pond.

There should be a suitable planting for a background on the north and northwest portion of the pond to protect the lilies from the cold winds. Native trees of graceful habits can be utilized for a little distance from the pond, with willows and grasses between and coming down to the water's edge. The following can be very successfully used in the adjacent border:

Arundo donax is a giant grass which grows to a height of ten or twelve feet, and makes noble clumps; also a variegated form of the same.

Various kinds of Bamboos are desirable.

Eulalia gracillima univittata is a very graceful plant. Its narrow long leaves having a silvery midrib.

Eulalia Japonica Variegata and Eulalia Japonica Zebrina are variegated forms, all having showy plumes in the late summer.

The hardy Ferns can fill many a shady nook and render an air of grace and beauty distinctly their own.

Pampas grass with its stately, silvery plumes is produced on stems six to eight feet high. This is not hardy here.

Pennisetum is a low-growing annual grass with silky plumes.

There are several tender foliage plants that can be successfully intermingled with the hardy sorts to add to the beauty and tropical effect of the surroundings.

The Banana with its stately foliage is always a valued acquisition.

The Ricinus, or Castor oil bean, is desirable in limited quantities.

The Cannas, if in your selection you pay more attention to the varieties that have vigorous foliage, are a great addition.

The Caladium Esculentum, sometimes called Elephant's Ear, is an admirable adjunct to the outside border, the surface of the leaves being not unlike the Lotus.

If the grounds are extensive—

Clethra Alnifolia (Sweet Pepper Bush),
Azalea Viscosa (Swamp Honeysuckle),
Ilex Verticellata (Black Alder or Winter Berry),
Kalmia Latifolia (Mountain Laurel),

are desirable for planting in low places.

The evening primrose with us last season, opening with the night-blooming lilies, offered quite a little attraction. Its individual flowers were very similar to the Water Poppy. This, of course, was grown in the outside border and with its stalks of light yellow blossoms produced a picturesque effect.

Some object to water gardens, fearing that they will produce a large crop of mosquitoes; but this need not prevent any one from having such gardens, as sunfish or goldfish in the water live upon the animalcule, and the mosquitoes no sooner appear than they are gobbled up. A drop or two of olive oil is some-

times put on the water to keep them out. In my experience I have never had any trouble from this source. Sunfish are apt to eat the young goldfish. The latter are generally used alone. They seem to be as hardy as the lilies and will remain in the pond during the winter months in darkness, or they can be removed to a cold greenhouse.

Frogs soon find their way into a pond, and do no harm, but turtles should never be allowed, as they destroy the young growth and flower buds of the lilies.

In the event of any Aphis coming on the lily buds or flower stems, water from the hose will soon dislodge them. It is not advisable to use insecticides; however, should occasion demand it, the Bordeaux mixture can be used, provided it is made one-third the strength that is used for ordinary plants. In the economy of nature there are several bugs that perform the duty of destroying insects.

The plants of the water garden would not be members of the vegetable kingdom if they did not have some enemies; but these need not prevent us from growing aquatics, for the result of our efforts will more than repay us for any labor we may bestow on them.

I trust that these fragmentary remarks will create in you a desire to give some attention to Water Gardening, for I believe it will afford you a great pleasure, and not you only but all who may be permitted to watch with interest your efforts.

It may be within the province of this Society to encourage the growing of aquatics by offering prizes for amateur displays, and thus add another feature to their interesting exhibitions.

Do not feel that you must possess a large tract to transform into tropical splendor, but take advantage of whatever facilities are within your reach, even if it be but two half-barrels sunk in the ground in the sunny corner of your garden, containing a lily plant in each with a few grasses back of them to make the lilies feel at home; and if your domain forbids this you certainly can enjoy a water Hyacinth, growing in a glass jar in your living room.

The following is taken from a report of the Park Commis-

sioners at Albany: "There is no feature in the floral display at Washington Park that has given such universal satisfaction as this aquatic plant display, and none that with ordinary care will more fully recompense the caretaker. It is a feature that is being introduced in every prominent park in the country, and a great many private estates of prominence." Thus you see that the possibilities of improving estates and parks that have existing water features is very great and it is an improvement that can be accomplished at no greater cost than is too often expended for far inferior results.

In addition to the aquatics, as I have before stated, the many water-side plants which seem to thrive only in these favored localities contribute even greater beauty to the scene. For, with the flora of the waters, this luxuriant growth of the swampy banks unites with the majestic growth of trees in the background, and produces a picture that for grandeur surpasses in beauty any formal attempt at gardening.

MASSACHUSETTS AGRICULTURAL COLLEGE.

3d March, A. D. 1898.

# ESSAY

BY

Mr. LATHE, Worcester, Mass.

*Theme:—Travels in the South.*

Philadelphia is the third city in population in the United States. The city hall is the largest in this country. It is nearly 500 feet square, has 14 acres of flooring, and 720 rooms, including the rooms in the basement. The tower is 500 feet high. William Penn stands on top of the tower in bronze, 37½ feet high, weighing 20,000 pounds, making the total height, 537½ feet. The cost was $20,000,000. Worcester city hall is 85 feet wide, 217 feet long, and the tower is 200 feet high.

The next wonder in this city is Wanamaker's store. It has thirteen acres of flooring, fifty departments under one roof and all entirely separate. The restaurant will seat over eight hundred people. Over 3,000 are fed daily. Christmas week over seven and one-half tons of candy were sold. There is a sitting-room and a reading-room for men and women. You can spend the day at the store in trading, reading and visiting, and you can get a lunch or a good square meal. It takes twenty-three tons of coal a day to warm, light, and run the thirteen elevators. it takes one hundred and twenty horses and sixty delivery wagons to deliver the goods and to haul the goods from the depot to the store. Quite a good many old people go to the store, where they read, visit, tell stories, and have a good time generally. More than seven miles of two and one-fourth inch pneumatic tubing, reaching to eighty-one pay stations in many

parts of the store converge at one point, where twenty-nine cashiers are required to attend to the business they bring. More than three acres of flooring are covered with samples of furniture. In one day nine hundred chairs were sold. Thirty-five hundred people are employed in the store, a city under one roof.

Next comes Wanamaker's Sunday-school. The object is: To teach the word of God; to lead souls to Christ; to build up Christian character; to encourage and assist Christian workers; to train everyone to usefulness. In 1858, Mr. Wanamaker held his first Sunday-school. He had twenty-six scholars and two teachers. Now he has an average attendance of twenty-five hundred scholars and one hundred teachers. The building was enlarged last year one-third its original size. The orchestra is composed of twenty-three pieces. The first half hour is devoted to the opening exercises. Six or seven pieces are sung and the singing is very fine.

One of the attractions at Wanamaker's store was a vegetable wedding. The bride and groom were the cucumber and tomato; the notary was horseradish; the mother-in-law was cauliflower; the witnesses were leek and asparagus; the invited guests were celery and carrot; the musicians were the black beans and peas; the magistrate was cabbage.

Baltimore. I was there on the nineteenth day of April just thirty-three years after the riot. I went out on the street where the riot took place. At the time of the riot a train of cars could not cross the city, so the cars had to be hauled through by horses. On Pratt Street the mob became so enraged that they tore up the track, and then the soldiers had to march. It was while they were marching that the mob threw stones and bricks and killed two of them and wounded several. It was now the soldiers' turn. They were ordered to fire, and the result was that some seven or eight of the mob were killed. This closed the affair. It was the Massachusetts Sixth from Lowell, Mass.

Richmond, Virginia, is a city set on hills. The colored people of this city have the finest colored church in the South. It cost $40,000, and was paid for by the colored people. One

white man gave the chandeliers, which cost $500. The colored people have their churches, Sunday-schools, and day schools, all through the South, entirely by themselves. They have teachers and ministers of their own color. There is one thing about the colored people, they are a church-going people, and they bring up their children to go to Sunday-school. They have a large church membership, mostly Methodists and Baptists. Jefferson Davis made this city his headquarters during the rebellion. The house he occupied is now used for a graded school. He attended Saint Paul's Church and was in church when the news came that Lee had surrendered (it was half past ten Sunday morning.) The news was not unexpected. He had but a short time to give his orders, pick up his traps, and leave the city. His orders were to destroy all the liquor and tobacco, and set fire to the city.

I visited a Confederate cemetery. Nothing is left to mark the spot but the Pyramid, which is built of rough stone fifty feet square on the ground and runs to a point ninety feet high.

Had it not been for the Tredegar Iron Works the South could not have held out as long as it did. These are on the James river below the falls. The James river is not navigable above Richmond.

Jefferson Davis was determined that the Yankees should not have any of his rum or tobacco, and the first thing our army had to do when they got to Richmond was to fight fire. The city is now built up, and is a nice, healthy place. The air is pure and the water good, and the climate splendid. The State House is on very high land, and from the tower a fine view of the city, country and the James River can be seen. The park where the State House stands contains four acres. There are some fine pieces of statuary here, a statue of Stonewall Jackson, upon which is written, "erected by Englishmen," among other things. There is a beautiful spring of water in the park. There are a lot of tame squirrels in the shade trees and if you sit down to eat peanuts, you will have plenty of squirrels to help you. There is a fine of five dollars for killing one of these squirrels,

and the same fine for killing a turkey-buzzard anywhere in the South.

Athens, East Tennesse, is a city of four thousand inhabitants. It is located between Chattanooga and Knoxville. The country is mountainous and hilly, and numerous springs of water flow from the hills. The waste water from some of the springs would fill a six-inch pipe. The climate is mild and very healthy. There is a jean factory, a thread factory and chair factory in the place. The State abounds in timber, marble, coal and iron. All that is wanting is capital and brains to utilize it.

The Grant University is located here and is in a flourishing condition. The jean-clad, log-cabin mountaineers are a sight to behold. There are so many patches on their clothes that it is hard to tell what the original was. Some of them hardly ever get out of sight of their cabin. They are a very ignorant class of people.

I went out to Mouse creek to see some of the old slave plantations and found the proprietor of one of them living. He was very willing to talk, said he was eighty-four years old, and that slavery was a curse to the South from the fact that slaveholders' children were not brought up to work, and when the slaves were liberated he owned fifty and was glad when they were gone. Said he could hire a nigger cheaper than he could own one. His son was carrying on the plantation and raising fine crops. Other plantations near him equally as good as his had not been cultivated since the war. The land had grown up to sage grass and they were hunting rabbits in it.

I found some very nice dairy farms. I went to one farm where the waste water from the spring was utilized to do the churning. He had a silo, but he let the air get to it and it was spoilt, you could smell it a long distance from the barn.

Court week is a great week in Athens, everyone comes to town on horseback, some on law business and some to trade horses. The county owns some four or five acres of land that is used for a trading ground. It is all covered with hitching-posts free for everyone. The cry is, "How will you swap?" or "How will

you trade?" One thousand horses can be seen in Court week all wearing saddles on their backs. It is much safer on horseback than in a wagon, as the roads are bad.

Salisbury, North Carolina is a city of four thousand inhabitants. They have nine churches, four for the colored people and five for the white people. The colored people have a Normal school and a graded school, and draw as much money per scholar as the white children do. I think the colored children are fully equal to the white children in learning and far ahead in behavior. When I was in the graded white school, I noticed a bunch of sticks, and very soon one of the teachers from another room came in to borrow some sticks; he said he had used up what he had. When I was in the colored school no sticks were needed, and I was surprised to see how quick the scholars would put an example on the blackboard and explain it. Their recitations both in the day and Sunday schools were very prompt. The little ones not more than four or five years old had a short verse of scripture, which they would recite as quick as their turn came. I attended the Methodist Church most of the time I was there. The Sabbath-school was in a very prosperous condition, and the class that got the largest collection was a banner class. The class that had the most perfect lessons was a banner class also. The organist was a young lady from Amherst, Mass. The people are very sociable, hospitable and entertaining. An invitation to tea is "I want you to come to break bread with us."

The city is nicely laid out in square blocks. The well-to-do people take a whole block for a house lot. They have fine large shade trees and their surroundings are very pleasant. The streets and roads are not repaired and are in bad condition and there is no pleasure driving. The soil is red and in the winter is very muddy and sticky. Where the principal street crosses Main street there is in the centre a well with a large wooden log pump. This is public property and here is where people gather when they come to town, every Saturday afternoon. One man came riding an ox. When asked what he did with him he said he made ten barrels of corn with him.

The native whites and blacks of North Carolina are to be pitied,

they are too shiftless to get a living, they cannot get credit at the stores; so if they have any property they have to mortgage it, including their tobacco crop to the merchant. Then they can get trusted. The tobacco is brought to market and sold at auction and the merchant takes the pay.

The roads are so muddy that half a cord of wood is as much as two horses can draw to market. It brings from seventy-five to ninety cents per load. Chickens that, dressed, weigh four pounds, bring twenty-five cents each. Eggs bring twelve cents per dozen, and other things in the same proportion. The land is worn out and will not produce crops unless fertilized. It takes five acres to raise what one ought to raise. Grass will not grow on the plowed land. Some people who keep a cow can raise a patch of clover. The creek lands will raise quite good crops without putting in any manure, one stalk on a hill.

Salisbury is noted for its prison pen, some call it the stockade. It was where the Union soldiers were put who were taken prisoners. This prison pen has about five acres of land with a few old wooden buildings on it, not enough to shelter one-half of the prisoners, enclosed with a board fence. It was within this enclosure that eleven thousand seven hundred Union soldiers died from exposure and starvation during the war. Some of them were found with a death-grip on a corn dodger. They were buried near by in deep trenches. A granite monument marks the spot. The grounds comprise six acres, and are enclosed with a nice cemented wall five feet high. The Government keeps a man to care for the grounds, and every visitor is asked to register his name. I found some names from this county and I found seven marble slabs with inscriptions on them lying on the ground above the dead bodies.

Some fifty odd years ago, a wealthy man died in the city of Philadelphia, by the name of Stephen Girard. He was born in France. When he was a young boy he met with two great losses. His first was the death of his dear mother. Then while he and some boys were having a bonfire, one of the boys threw some wet oyster shells in the fire and a sharp piece of the shell struck Stephen in the eye and he lost the sight of it. So with one eye

he started out to make his fortune. He learned the ship-carpenter's trade, then he built a ship for himself and started out as a merchant and mariner on the high seas. He would go to one section of the world to load up, and then go to another place to sell. At one time in his life he had many ships afloat on the high seas. He prospered and accumulated a large fortune, and when old age overtook him he sold out and came to Philadelphia to spend the remainder of his life. About the first thing he did was to make a will; he gave to his help who had grown old in his service an annuity to be paid quarterly during their lifetime, and he gave large sums to benevolent objects. He made all of his relatives well off so far as this world's goods were concerned, and then he gave to the State of Pennsylvania $300,000, and to the city of Philadelphia $500,000. The remainder of his property he gave to the city of Philadelphia to found a college for the training and educating of the orphan poor boys of the city of Philadelphia and of the State of Pennsylvania. The grounds consist of forty-five acres of land enclosed in a nice cemented wall ten feet high. The gatehouse is on the east, and everyone has to go through it to get into the college grounds. A stranger has to get a permit to go in.

This forty-five acres is about five times as long as it is wide. An avenue goes through the centre of the lot. The college is on the east end and buildings are on both sides of the avenue, including a very large power house. Here is where the boys learn the trades. They get not only an education but a trade as well. The college is a marble building with a marble roof, from which a fine view of the city and country can be obtained. There are thirty-seven marble pillars that hold up the roof that covers the piazza on both sides and at one end. The playground is in the rear of the college. The chapel is near the centre of the grounds. The boys march from the college to the chapel every day at nine o'clock and four o'clock for religious instruction. The chaplain reads the prayer and scriptures and the boys do the singing. It would surprise you to see one thousand boys between the ages of ten and eighteen marching from the college under military discipline. They enter the chapel in companies, every boy gets

a seat as quick as possible and the room is very quiet. In pleasant weather, every Friday after prayers, two hundred of the boys dressed in uniform, each boy carrying a gun, march to the playground, where they have a band of music, and where they go through a drill in which they do themselves great credit.

All boys under ten years of age have their meals in another building, and it would do you good to see those little boys take their places at the table. They fold their hands and do not stir until the blessing has been said and they have been helped. There are over five hundred boys. Each boy has his wash-dish, towel, soap, comb and brush, and he has to put them in their place. The same is true of all his clothes. When these boys graduate they have three suits of clothes and no bad habits, such as drinking, smoking and using bad language. They are taught to mind on the instant when spoken to. They graduate when sixteen or eighteen years old, and their services are in demand. Temperance young men are always in demand, and always will be. This college was opened January 1, 1848, with one hundred boys. Since the opening of the school, five thousand seven hundred boys have been clothed, fed and educated, and a great many of them have learned a trade.

There were, one year ago, 1,536 boys at the college. The trustees are preparing to take in more boys, as there is money enough to care for them, as soon as suitable buildings can be built. The cadets, two hundred in number, go out to Island Heights, New Jersey, for a summer encampment which lasts three weeks. The drills they go through with do them great credit, and large crowds gather to witness their drills.

When the yellow fever was in Philadelphia, Mr. Girard procured a pesthouse and took care of the sick himself, and he never lost a patient. At one time he saved the city from bankruptcy by lending them money, and he also helped the Government by lending them money.

There has been some fault found with Mr. Girard because he would not let clergymen into the college. I will give you his exact words in relation to it. "I enjoin and require that no ecclesiastic, missionary or minister of any sect whatsoever, shall

ever hold or exercise any station or duty whatever in said college; nor shall any such person ever be admitted for any purpose, or as a visitor within the premises appropriated to the purposes of the said college. In making this restriction, I do not mean to cast any reflection upon any sects. There is such a diversity of opinion amongst them I desire to keep the tender minds of the orphans, who are to derive advantage from this bequest, free from excitement, which clashing doctrines and sectarian controversy are so apt to produce. My desire is that all the instructors and teachers in the college shall take pains to instill into the minds of the scholars the purest principles of morality. So that on their entrance into active life they may from inclination and habit, evince benevolence towards their fellow creatures and a love of truth, sobriety and industry, adopting at the same time such religious tenets as their natural reason may enable them to prefer."

10th March, A. D. 1898.

# ESSAY

BY

PROFESSOR JOHN W. CLARK, NORTH HADLEY, MASS.

*Theme: The Outlook for Profitable Fruit Growing in Massachusetts.*

IN the early history of our State the planting of fruits was simply for home use; commercial orchards were not thought of.

The varieties planted were those brought from the mother country, and trees grown from seed without being grafted.

In most cases the varieties brought from the mother country proved unsatisfactory, and were replaced by the best of the many seedlings that had sprung up among the colonies. This was more especially true of the apple. In the earlier days of the colonies, and for some time after, one of the chief uses made of the apple was the production of cider and its products.

In the fourth report of the Massachusetts State Board of Agriculture (that of 1841) this statement is found in regard to apple orchards: "Fruit is cultivated in the country at large to a comparatively small extent, and since the progress of the temperance reformation throughout the country, cider has fallen into almost entire disuse. Apple orchards are neglected, and young orchards are not planted as frequently as formerly." This made the orchards composed of seedling trees bearing their natural fruit of little value, and, being left to care for themselves, they gradually died out, and for some time few apple orchards of any great extent were planted; but, as the State increased in wealth and population, more and better fruits were called for, and this caused a revival in the planting of

fruits, which, with periods of depression and renewed interest, we can follow down to the present time.

This is not only true of our own State, but of the whole country. Special fruits have been found to be especially adapted to the soil and climate of different sections, and in many instances the production of this special fruit or fruits has become the chief industry.

It was only a few years ago that our markets were supplied with nearly all of its fruit from the surrounding country, little being received from outside the State; but as railroads began to multiply and the cost of transportation to cheapen, fruits from other sections began to be seen in our markets, and as the science of handling, packing and shipping fruits became better understood, the distance of shipments increased, so that to-day we have to compete in our markets with grapes, peaches, pears and plums from California, peaches from Georgia, grapes from Ohio, apples and grapes from New York, and apples from Michigan, Missouri and Nova Scotia, to say nothing of the immense quantity of oranges shipped from California and Florida.

Although the orange is not grown by us in Massachusetts, it probably affects the market price of our apples more than all of the other tropical and semi-tropical fruits put together, and it will continue to do so.

Before the day of rapid transit and shipping of fruits in specially constructed cars, and the introduction of cold storage, it often happened that a partial failure of the crop in one section caused a corresponding scarcity in the markets of that section, and prices advanced to a point that was out of the reach of all but the wealthy. Today this does not happen for any length of time.

Our country extends over such a range of territory and has such a varied climate that the general failure of a crop in the temperate portion of our country is an unheard of occurrence. A shortage in one part is soon made good from other sections. In making an estimate as to the price of any of our fruits, we must take into account the crop of the whole country, for, as

soon as the price warrants it, a shortage will be made good from somewhere, and this, with cold storage to carry fruits over a longer period of time, prices in the future will not show such extremes of variation, but will be more uniform.

Much has been said and written in regard to the barrenness of our soil and the severity of our climate, preventing us from growing many of the choicer kinds of fruits.

This may be true to a certain extent. Still, we need not get discouraged, for, from what I have seen and been able to learn, I am convinced that those who have suitable lands, favorably located, can, with proper care and business capacity, make the growing of fruits as profitable in Massachusetts as in any other part of our country.

We hear many flattering reports of the fruits grown in different parts of our country—the quantity of fruit produced, the ease with which it is grown, and the money that can be made in California, Florida and Georgia in growing fruit. This may look well on paper, but when the plain facts are known the low price which the fruit brings if sold to local dealers, and the unsatisfactory returns received when the fruit is shipped on commission to northern and eastern markets, it is evident we have no need to envy our southern and western competitors. We should always bear in mind that the nearer we are to markets where the population is a consuming rather than a producing population, the better will be the prices obtained for our products.

We may not be able to grow fruit with as little care and expense as in some of the newer parts of our country; where everybody can grow with little expense a certain fruit, the price of that fruit is correspondingly low, for every one wants to sell and no one wishes to buy.

We have here in Massachusetts the advantage over any other portion of our land, in that we have the best markets that the country affords at our very doors, and our population is a consuming and not a producing one.

Of all the fruits grown in Massachusetts, the apple stands first, and not only is it first with us, but of the fruits of the tem-

perate zone the apple is the most important, and notwithstanding what has been said about our soil and climate, Massachusetts Baldwins, Greenings and Roxbury Russets stand first in the markets as to quality and size, and usually lead in price. Although Maine, New Hampshire and Vermont may have varieties that are of better flavor, and will keep longer, their Baldwins, Greenings and Roxbury Russets are smaller in size, and, as a rule, sell for less money.

If we can grow better Baldwins, Greenings and Roxbury Russets, and get better prices for them than they can in other sections, we may be well satisfied, so far as the production of apples is concerned.

Massachusetts has hundreds and thousands of acres of land well adapted to the growing of apples and other fruits that today is made of little use. If this land could be planted to fruits by the right individuals, the income derived from it would be increased, and, instead of growing less year by year (as farm property throughout this and other States has for the past twenty years), its value would be increased.

There is a town in this State where the assessed value of farm property, with but one single exception, is less than it was twenty years ago. This land was planted to fruits, and instead of being assessed the same or less than it was twenty years ago, it is assessed four times what it was then, and the assessors say "it is not now assessed one-half what it is worth." Here is an instance where Massachusetts farm property has not decreased in value, and there can and should be hundreds of similar cases scattered over the State.

It may be said if apples are planted extensively the markets will be overstocked and prices will drop to such a figure that there will be no profit to the grower. It is just here that a revolution must come in the marketing of all our fruits. It is not the quantity of choice fruit, well handled and packed, placed on the market, that breaks the price, but the inferior fruit or good fruit improperly handled that gluts the markets.

This poor fruit forced on the market must be disposed of for what it will bring, and this prevents the sale of good fruit, un-

less one is willing to sell for a correspondingly low price. Every barrel of inferior apples sold practically prevents the sale of a barrel of choice fruit, and every barrel of apples sold that is improperly handled or dishonestly sorted and packed causes the purchaser to lose confidence, and he is unwilling to pay as much as he would if he was sure every time of getting a barrel of apples honestly packed.

There is not too much good fruit sent to market, but too much inferior fruit, for which some other use should be made. It is not from those who take good care of their orchards that the bulk of the improperly packed and inferior fruit comes, but from the average farmer, who either does not know how or will not take the trouble to care for his trees or handle the fruit as it should be.

The time has passed when apples can be grown and made to pay under snch treatment, and the sooner the average farmer goes out of the fruit business the better off will he be.

These orchards have not paid in the past, and the chances are that they will pay less in the future as competition increases and the markets call for better fruit.

The fruit business is following in the line of other industries, and is becoming a business of itself. More are making fruit growing a specialty than in the past. More orchards containing thousands and tens of thousands of trees have been planted by single individuals or stock companies during the past fifteen years than ever before, and this extensive planting it still going on. It is only about ten or twelve years since California first began to ship fruit to our markets to any considerable extent, and but about fifteen years since the exporting of apples to Europe began to be an important factor in the handling of the apple crop.

How important a bearing the exporting of apples has upon the home markets can be known when we realize that during the season of 1896 and '97 nearly 3,000,000 barrels of apples were shipped to Europe. If we should look through our list of fruits we shall find that commercial fruit growing has nearly all sprung

up since the close of the Civil War, and the greater portion of it within the past twenty years.

The peach has attracted considerable attention during the past few years, and many large orchards have been planted. Some have proved a success, others have proved a failure.

This has been the history of peach growing in this State. In looking over the reports of the Massachusetts State Board of Agriculture of fifty or more years ago I find this statement is made: "Peaches do not do as well as they did fifty years previous, and the greatest success is obtained where trees are planted on high ground."

This is no less true today than it was one hundred or more years ago, and the site selected for the growing of peaches should be land higher than that of the surrounding country, having a good circulation of air, where the fruit buds will be less liable to be killed during the winter.

Still there is no certainty that the buds will not be injured in Massachusetts even when the trees are planted in the most favorable situations. During the past seventeen years peach trees with me have given good crops in 1883, '89, '93, '95 and '97, and partial crops in 1887, '88, '91 and '94, making five good crops and four partial crops. I do not think it wise to reckon on over two full crops of fruit during the life of a peach tree here in Massachusetts. At least in my locality the price of home-grown peaches is not what it used to be, the price of the '95 and '97 crops being very low. There will probably never come a time when all the home-grown peaches, if well grown, will not find a market at a price above that of southern peaches, on account of their better flavor, color and less waste.

With small fruits the markets of the future will be supplied with its best fruit from local sources, and those who grow the best fruit will sell their products at a profit, while the grower of inferior fruit will be compelled to sell at a loss.

In the growing of fruits it is the same as in other kinds of business. More depends on the man than on the business, and if one has not a liking for fruit growing and is willing to take for his motto and live up to it, "Eternal vigilance is the price

of success," he had better never undertake it, but if one has a love for the business, and the necessary stick-to, push and energy, I for one can see no reason why the growing of fruits cannot still be made as profitable in this as in any other State in the Union.

# ANNUAL REUNION AND SOCIAL GATHERING.

MARCH 9, 1898.

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An informal reception for members and invited guests was held in the hall and adjoining rooms from six until seven P. M. The company then marched to the banquet hall, Bicknell's orchestra playing a march. After prayer by Rev. George W. Kent, supper was served by Curtis S. Yeaw.

At the guests' table were Mayor Dodge, Gen. F. H. Appleton, Pres. of Massachusetts Horticultural Society, Gen. Henry W. Wilson, George Cruikshanks, Pres. of Massachusetts Fruit Growers Association, Prof. John W. Clarke, Prof. S. T. Maynard of Amherst Agricultural College, Prof. L. F. Kinney of R. I. Agricultural College, Dr. C. F. Hodge of Clark University, C. F. Carroll, Supt. of Schools, H. P. Lewis, Prin. of English High School, E. P. Goodwin, Prin. of Classical High School, Hon. Stephen Salisbury, F. L. Hutchins, Pres. O. B. Hadwen, Secy. A. A. Hixon, and Toast-master Hon. Henry L. Parker. After spending an hour enjoying the feast, President Hadwen called the company to order.

## WELCOME BY PRESIDENT HADWEN.

*Ladies and Gentlemen:—*

Again it becomes my privilege to extend to you a cordial and hearty welcome. The recurrence of another year, the fifty-sixth anniversary of our Society, brings together our members and their friends in social intercourse; as we look around and behold so many well remembered countenances and listen to the friendly cheers greeting each to the other, and every one who addresses you, I may well congratulate the Society on the liberal and increasing interest of the community so manifest in all our entertainments and exhibitions; in the continued improvement

in the flowers, fruits and vegetables exhibited during the past year, with the advance so notable with each recurring season.

Horticulture is the one pursuit in natural science in which all, without regard to age or condition in life or degree of education and refinement, unite. It presents a common field where every degree of taste and refinement may find an extended opportunity to pursue a course of culture, suited to the ambition and tastes of each and every one. He finds here no obstruction in the pursuit most conducive to his talents, but tending to encourage a course which attracts and delights all, whose enterprise is directed to improve and broaden the horticulture of the county.

Each successive year shows a marked and gratifying progress in the beautiful belt of towns in our county which surrounds and clasps our city like a "jewelled zone." Ornamented grounds and gardens are yearly encroaching upon uncultivated fields and wooded places; tasteful dwellings are seen within the plantings and groupings of coniferous and deciduous trees, with their exquisite foliage sheen, which gives them such attractiveness and quiet beauty, whose roofs shelter the manly and gentle virtues that are nurtured in refining homes; and the intelligence and influence that are generated around these hearthstones are the lineal descendants that contribute to the useful pursuits of life. I feel that we are reaping no scanty harvest for the good seed sown by the men of noble deeds, the founders of this Society. I feel that the Society is especially making itself manifest in this work by its encouragement of those refining rural tastes and the virtues which are its allies, contributing to make people happier and better.

I feel that this Society is doing well its legitimate work by diffusing and encouraging a wholesome taste for those simple and rural pleasures which add to and prolong the lives and happiness of its members. It teaches our contributors the art of careful selection of fruits in size, color and form, and the same may be said in the selection of vegetables; and is even more advanced in the cultivation and selection, in the display, of flowers, with the artistic blending of colors. It has taught the community the principal essentials in the cultivation of the soil to ensure the

best results. It has contributed the essentials of good and wholesome living, both to those who cultivate the soil and to those who consume the products of horticulture, and it is contributing its full share to the amenities of life; its scope broadens with the advance of each season; new fruits, new flowers and new vegetables are brought out, new shrubs and plants are introduced, new trees, both deciduous and coniferous, are freely planted in parks and private grounds, each and all contributing its full share in the aggregate to the higher and finer art of horticulture.

We may also congratulate ourselves that our lives were cast in pleasant places, and within this our goodly heritage we can appreciate the advantages we derive from the object lessons of our exhibitions, and the education and refinement derived from the essays and discussions at the sessions of the winter meetings.

Every tree, whose leafy boughs catch the morning light and waves its graceful head with every breeze, is a practical work of horticulture; and every flower that opens its tiny bud to drink the dew of the morning,—each forms a part of the wondrous work, where nature is assisted by man.

With grateful memory we recall all who have contributed by their wealth, their wisdom, their untiring devotion and enterprise in building the Society up to its present standing among similar societies of the country. If we have nurtured the important work of disseminating information on the higher art and pursuit of horticulture, our labors have not been in vain. If we succeed in awakening an interest or the latent love of the cultivation of fruits and flowers and implanting it in the minds of the young who are to become our successors, we may feel that we contribute to horticulture, the most pleasing of all arts, and have fully kept pace with the rapid progress of the age.

When the returning season fills us anew with its promised hopes we again renew the seed planting in the garden soil. Nourished by sunshine and showers they soon send forth the germ of life with a vital energy. It starts into being with all their varying aspects. Such experience fully illustrates the lines of Wordsworth—

"Nature never did betray
The heart that loved her; 't is her privilege
Through all the years of this our life, to lead
From Joy to Joy; for she can so inform
The mind that is within us, so impress
With quietness and beauty, and so feed
With lofty thought, that neither evil tongues,
Rash judgments, nor the sneers of selfish men,
Shall e'er prevail against us, or disturb
Our cheerful faith, that all which we behold
Is full of blessings."

I have thus, my friends, briefly endeavored to break the ice, let me hope not entirely inconsistent with the spirit and purpose of the occasion.

"God Almighty," says Lord Bacon, "first planted a garden;" and indeed it is the purest of human pleasures, it is the greatest refreshment to the spirits of man; without which buildings and palaces are but gross handiwork!

But I must not prolong my remarks. There are others to speak to whom you will all be delighted to listen.

I now have the pleasure of introducing our honored friend and ex-president, Henry L. Parker, who will act as toastmaster for the occasion.

## ADDRESS OF HENRY L. PARKER.

*Mr. President, Fellow-Members, Ladies and Gentlemen:—*

In the midst of warlike rumors, preparations for war, and all the excitement dependent thereon, this is eminently a peaceful assembly. We do not want war, but in view of the recent action of Congress, appropriating fifty millions to be used by the President at his discretion, we may well say as John Bull once said, "We don't want to fight, but by jingo, if we do, we 've got the ships, we 've got the men, and we 've got the money too." But as I said, this is a peaceful assembly.

We come up here annually to cure our warlike spirit, to heal our differences, to bury all the little animosities and differences that may have germinated during the year, to cultivate fraternal feeling, and we come here and meet in our own halls upon our

own premises not simply for our own enjoyment, but to extend our hospitality to others, our friends and neighbors, our friends both at home and abroad.

We are fortunate this evening both in the number and quality of our guests—our new Mayor, who has already earned an enviable record, the distinguished and accomplished President of the Massachusetts Society, superintendent and principals of our schools, professors from Amherst and Clark and the Institute of Agriculture, Rhode Island, and presidents of many of our local institutions, guests also from the Fruit Growers Association—and fellow-members in your name and behalf, I welcome these our guests in the festivities of this evening.

Now I presume that a large proportion of this audience have somewhat the feeling of the colored man down South, who was in the employ of a stanch churchman, an Episcopalian. He used to attend church with him as long as he worked for him. He left his employment, and his employer having missed him from church met him one day and said, "How is it that I have not seen you at church lately?" "O yes, I go to church." "Well, but I have not seen you at our church." "O no, I am a Methodist." "How is that?" "Well, you see, Massa, the Methodists, they get right down to business and give us a good gospel service, while these Episcopalians take half the time to read over the proceedings of the last meeting." Now I presume the younger portion of this audience would be very glad to waive these proceedings and get right down to business on the floor below, but there is another portion who believe that a feast is never quite complete unless flavored with a little salt.

Now we must divide the time the best we can between these two elements, and right here I will caution the speakers to make their addresses short. The President has suggested that they be limited to ten minutes, but I think that would be a rather arbitrary rule. I know last year one of our speakers, feeling that he must come within that limit, broke off suddenly in the midst of the most interesting speech, although there were loud calls for him to go on. Well, that gentleman is here tonight and we will have the remainder of that speech, but if any

speaker should be talking a long while and not really saying anything at all, it would not surprise me if the President should rap on the table.

It is stated that a little girl in this city, the daughter of a prominent politician, was saying her prayers one night. She had been taught to pray for brothers and sister, father and mother, and she wound up by saying, "Now, God, you take care of the city for if we lose you we should have nobody to look after us but Mayor Dodge, and papa says he has the bridge on his hands and he cannot do everything."

I now have the pleasure of introducing to you our Mayor, Rufus B. Dodge, Jr.

Mayor Rufus B. Dodge, Jr. *Mr. President, Ladies and Gentlemen, and Fellow-Farmers:*—I assure you that it delights me beyond measure to meet with my fellow-agriculturists. It is refreshing indeed to see Farmer Parker without his overalls and jumper, and Farmer Paine, leaving his pastoral pursuits and donning his dress-coat, a luxury which we farmers cannot often enjoy.

I was approached a few days ago by a musical gentleman of the city who desired my name in connection with some musical entertainment. I said to him while I would be very glad to endorse it, I feared it would have but little weight if the fact was known, because, to tell the truth, I was unable to tell the tune of Yankee Doodle from Old Hundred, which I assure you is a fact. And he remarked that if that were true I had certainly missed my calling, that I ought to have been a musical critic. And taking that for a fact, I see no reason why I cannot discuss with the farmers of the city and the growers of plants and fruits all the great questions which make them prominent.

The example which our elders set is responsible in a measure for the conduct of the younger people, and I must say that I deem it my duty to solemnly call your attention to the conduct of my venerable friend Mr. Hadwen when he told you the reason why he did not make a speech. The real reason of it was as he told me, and I have every reason to believe that it is true, that he had

it all typewritten and he brought here a letter which was typewritten instead of his speech. Now if my venerable friend, with that blandness with which he usually tells the truth, can utter such a statement it would justify me in almost anything that I may say. I shall detain you but a few moments. I will not even reach the limit which the toastmaster has set, because I have an appointment with my own family at a time which is somewhat past, and if I delay very much I shall have a worse state of affairs on my hands than the Spaniards have got on theirs; and, besides, I know something of what you have got to endure before you get through. That is another reason why I am going to leave early. You have Principal Lewis here, and I have heard him speak, and you have one or two others that I will not name, because if I name many more of them I am afraid you will all leave.

I was impressed on a visit to the Southwest and through what is called the Badlands of Texas to see the natural resources in reference to the production of the soil as compared with that of old New England, represented in this State by Worcester County, which is rugged and barren compared with the vast fertile fields which roll as far as the eye can reach in that vicinity. I suppose there lies in the northern and central parts of Texas perhaps as fertile a plain as the United States contains. I presume that if it were cultivated to the full extent of its resources, the State of Texas alone might produce all that this country would consume so far as feeding its inhabitants is concerned; but after all as you stand there and gaze over that vast expanse of territory, upon this fertile spot on the surface of the earth that appears to have been made by the hand of Providence for the production of food for man and all those things which come from the earth, and compare its value with all its advantages of nature to the value of the same acreage of land of Massachusetts or Worcester County, you realize at once that it is not the extent of territory, it is not altogether the fertility of the soil that makes the locality, it is not altogether what nature has done for this particular portion of the earth's surface. And there never was a time when all the peculiar value of the New

England fields came to my mind more forcibly than when I visited that locality, and never was a time when I more fully appreciated the fact that not only must you have the natural advantage, you must have the people. Beside your farms must lie your villages; beside the place where you produce your crop must live the city; combining the two, you have what we have in Worcester and Worcester County and in Massachusetts. We have our people, we have our manufacturing establishments, we have our farms, and we have enterprise in every branch and every business that is pursued within our city. We have met with success because we have deserved success. It has been wrought out by the ingenuity and perseverance of our citizens; it has been supported and fostered by your organizations and societies of which your own, as shown tonight, is a high type. It is indeed gratifying when men of intelligence, learning, and standing in the community, as shown by your members and attendance, feel so keen an interest in this department of your society that they give it their support and their aid. May it continue, and may your success be commensurate with what is deserved from the efforts of your members. May it continue to be an ornament to this glorious old city, the Heart of the Commonwealth; a city which shall grow and continue in prosperity beyond anything you perhaps recognize or realize today by a growth and expansion, healthy in all its departments, sound in all its undertakings, built up by its citizens with the common purpose to make here a city indeed worthy of the old County of Worcester.

Mr. Parker.—There has always existed between the members of this Society and the members of the Massachusetts Horticultural Society the most kindly and cordial relations. This evening we have the pleasure of entertaining its president, the Hon. Francis H. Appleton.

Hon. Francis H. Appleton. *Mr. President*,—It gives me great pleasure I assure you to have the opportunity of coming up from the suburban city of Boston and greeting you ladies and gentlemen this evening. It gives me pleasure to come up

and bring to your honored president and yourselves the hearty greetings of the Massachusetts Horticultural Society and bid you Godspeed in all your efforts for horticultural good. I am glad to come up here and pay my respects to so many who I know personally are experts and thorough horticulturists. It is an honor to come to this city which has such diversified interests to my mind, and if any troubles in the business line should come I do not see how it would be possible for them to affect Worcester much. She has no one basket of eggs like some cities; they are thoroughly scattered, much to her credit. It is a pleasure for me to come here and renew old associations. One early one has been referred to this evening, and it makes me feel that I hope they won't have a new bridge. That may be all wrong, I don't know the local feeling at all. But I will tell you why I say so. When I was a year or two younger than I am now, I used to come up here and cheer the boat-races, and it was one of the times when Harvard used to win and we had four consecutive years of my ruining my voice and Harvard's winning. I was told tonight that usually about twenty-five youths were shut up in one of your hotels, but I never got in there myself. It must be a very inhospitable place not to take everyone into the hotel. I have the most delightful recollections of that bridge, which existed then and I think it is the same one that is there today, a wooden bridge stretching from pier to pier, if I am not wrong.

Mr. President, there is a serious side to this, and a practical one which comes up into my mind. And it is one that I had the pleasure of speaking on in another part of Worcester County the other day. I am not an educator, I am not in that line, but I have had the honor of speaking on the subject, and, gentlemen, it has given me much pleasure to do so. It is that I wish that we could have a little more botany, a little more entomology, and a little more natural history in our schools. Not for those things in themselves, but for the powers of observation that come from studying those things, which it seems to me cannot fail to be of great value to everyone. Look at the grand men who came from the homes of New England where they were

brought into immediate touch with nature, where they studied all the growths of nature, not perhaps as they would today but they got thoroughly into it. They knew about them in a way, they cultivated the powers of observation which are so valuable to us all.

It is a pleasure to me to be here today in this city which is noted among other characteristics for its exquisite parks, which have been built up by the efforts of its citizens, helped wonderfully and handsomely by the gifts of individuals who have made themselves remembered by helping the city so.

Mr. President, as I said, I bring you the best greetings of the Massachusetts Horticultural Society, and long may you live to prosper in every way.

There is one more thing before I sit down. It is my burden at the present time to hold the office of Commissary-General of the State of Massachusetts. I do not speak of that egotistically at all, but perhaps you do not know that under the laws of the State, the Governor is in charge of the army and navy of Massachusetts, and he can also grant a passport, as I have had them from Governor Rice when I went to Cuba at the time of the first trouble there in 1869. Now Massachusetts may go to war with something outside of Massachusetts, therefore, I appeal to you to be prepared if it comes in my time to help me out with plenty of supplies, and I know they will be good ones if the city of Worcester helps to make them.

The Toastmaster.—I hope General Appleton will excuse me for not giving him his proper title, but the fact is he has so many positions of honor and trust that it would take perhaps as long as a short speech to give them all.

The General has spoken of putting nature study in our schools, and right here I will call upon Professor Hodge, a member of our school-board, and professor of physiology of Clark University, who is especially interested in introducing nature study in our schools.

Mr. C. F. Hodge. *Mr. President, Ladies and Gentlemen:*—I confess that I am rather glad to be called upon on a

subject like this for two reasons. The first one is that not long ago at one of the meetings of the Horticultural Society it was stated that Clark University stood for pure intellectualism. My joy in being called up is in the thought that I can repudiate a statement of that sort. Certainly the man who made the statement could never have heard Professor Hall lecture upon Education of the Heart, and Education of the Will, if he calls Clark University an institution of pure intellectualism. The truth of the matter is, I take it, Clark University stands for such a subject and things as the Worcester County Horticultural Society stands for, that is, for the kind of education which should be from the beginning active education. Now the old basis that Plato and Socrates laid down is that the first step toward virtue is to know what is best to do. We must have of course some knowledge as a basis of action. Nothing in the world is so terrible as active ignorance, so we must learn in order to know what to do, but unless we do what we learn to do what availeth our knowledge.

The other subject which has been a "Bee in my Bonnet" for some time, is that of nature study in the public schools, and it did my heart good to hear President Appleton bring it out as he did. It is something that I think is not appreciated by the more conservative portion of the Society. I believe our nature study is a movement back toward Paradise in the horticultural sense. If we can make it a study which shall give the young people of the country a knowledge as to what is good to do in horticulture, and then by some means or other induce them to make that education active, to bring it out in their lives and in their practice, we may have a horticultural community which will show the country what a city can be made to look like with a horticultural people in it. And right here I would say in conclusion, that the Worcester County Horticultural Society strong as it is, vigorous in all its branches, containing as it does practical and theoretical horticulturists (I count myself in both of these classes), can do the work for Worcester through the public school which no other institution in the place can do, and which it seems to me would be the legitimate work for the Horticul-

tural Society. To do that is to encourage the knowledge, or as the Constitution of the Society says, "the advancement of a knowledge of horticulture and its practice by doing something to encourage the children to actually raise flowers and fruits." I consider that a part of the child's education which is largely neglected today, but which would solve the problem of juvenile trespass in flowers and fruit and make it possible for those who love them to raise them unmolested; that is, if the child puts forth his energy to raise something himself he learns, in a way that you cannot talk into him or preach into him in a lifetime, the value of having something which he has raised. So I hope in the future that the Horticultural Society may possibly do something to encourage the kind of education in our child population that it has so faithfully encouraged in its own members.

The Toastmaster.—The professor was too modest to state that he had put his theory into practical operation in encouraging the growth of plant life in our schools by distributing seeds and offering prizes at his own expense.

Now I think we have said a great deal on this question of education and nature study, and will follow it up by calling upon the superintendent of schools, Mr. Clarence F. Carroll.

Mr. Clarence F. Carroll. *Mr. President, Ladies and Gentlemen:*—There seems to be no common ground between the city and the country. The moment a boy comes within the influence and atmosphere of the city he seems to be pretty thoroughly cut off from all the beautiful things that God has made and placed in the country.

I need not emphasize the distinctive tendencies of our city civilization, of all that is artificial and stimulating here, and I am very glad for just a moment to follow in the line that has been suggested by our distinguished friend, Dr. Hodge. I am glad that there is a society that has set as its purpose the restoring to some extent, to some slight extent, paradise in the city, that it has made our parks green, and that it is planting trees and building lakes, and giving to us some suggestions of what as a city population we have lost. I am glad that there

is an interest among the people themselves that is very deep and heartfelt in this direction. We see it here tonight; we can sense it at every assembly of this kind. When beautiful things are brought in from the world outside, we can feel it in the school-room,—I always like to say this whenever I have the opportunity in Worcester. Those of you who have had the good fortune to visit almost any of our school-buildings will find a veritable garden cultivated upon the narrow windows and in the corners of the rooms. I am glad, too, that our friends of Clark University have taken up this work, and that they are emphasizing it in the largest and best way.

I can just give you this one suggestion, that nature study, as it is suggested to us at Clark University, means the relation of things, and when we hear of the flowers, we hear of the insects that destroy them; and when we hear of the birds, we hear of the insects that are related to the birds; and when we hear of the apple, we hear of the insects—that I believe I heard Dr. Hodge speak of the other night—that destroy eighty per cent. of all the apples that are blossomed and that would ripen but for the influences that destroy them. I say this is the practical side of nature study, and we have reason to be glad that Clark University stands for something more than intellectualism, something that is practical. This reminds me of a little meeting that was held the other night in the City Hall. We had a solemn little conference, Mr. Hodge and myself, before hand. The point was to get some apparatus for the Upsala street school and some other material to go along with it. I told the doctor that if he presented the case it would come out all right. He stated a few of these little things as no one else could have done and the committee most gracefully and vigorously voted all that he asked for. I went out with one of them and he said: "I always thought those university professors were cranks, but evidently Dr. Hodge knows what he is talking about. There is something practical about it." I say this for the doctor's encouragement, and for this reason I am glad our friend, Mr. Appleton, has suggested more forcibly than anyone, perhaps, here would dare to the idea of introducing another study into the public school.

I would suggest that we introduce horticulture and agriculture into the public school. I think my friends who criticized our course of study will say that it is only another thing to burden the children, to bear them down and overwork them; but I am glad that it comes from Boston, everything that comes from Boston is all right, so there must be a good reason for saying that we want a little more nature study in the public school. I think we are safe, Mr. President, in the suggestion, and I hope that it will be followed up. I hope that in every schoolyard in Worcester there will be some green thing growing, a few fish swimming, something to suggest to the children the life that is so abundant and so beautiful in the boundaries of the city which some hardly ever reach.

There are sixteen suburban schools about this city. I visited one of them, beautiful in architecture, beautiful in situation, beautiful in its surroundings, and one of the teachers who had reason to know what she was talking about said that her father had promised to put everything into their yard that she asked him to. And she said: "We are going to have the grounds fixed up and we want you to come down later in the season and see them." The Bloomingdale is all trimmed up and fixed in the latest style, on horticultural principles. This is an interesting topic to me. It comes very near to me. I feel that these children are robbed of something in not having what we suggested for them. A student of one of our public institutions said to me the other day: "We are missing it in not putting into our country-schools something of horticulture. These children are farmers, all of them. We have our agricultural colleges, but they are rapidly becoming like other colleges." I hope this is not true of Amherst nor, indeed, of any other agricultural college. In a little town in New Hampshire I found that there had been forty-eight deaths and sixteen births, and that is about what has been going on in all the country towns. There are very few children left now. Of over forty children who attended school where I first taught, they are all gone but two! Is there anything our society can do to make them contented to remain in the country? Cannot we devise anything

by which they could make a good living and be contented upon the farm? That would be something for New England. A little celery patch, rhubarb patch, onion or flower patch is capable, as I understand it, of enabling the industrious and skilful man to make a good living. The Italian, the Portuguese, and other foreigners are skilful gardeners and able to earn a good living.

There is a great work for this Society in making it possible over New England to restore the population, to hold its own, and to hold an important place in the future history of this country. I am glad that I am from New England, I am glad I am from Worcester, and I am glad to be here tonight. I thank you, Mr. Chairman, and I thank you all for your attention, and predict the best things for this society and this line of work that is so strong and confident in this city.

The Toastmaster.—As a representative from the Rhode Island Agricultural Experiment Station, Professor of Horticulture, and a graduate of our agricultural college of Amherst, and what is of still more interest, a Worcester boy and a son of one of our most active members, it is a pleasure to me to introduce to you Professor Kinney of Providence.

Professor L. F. Kinney.—I cannot do less than thank the toastmaster for giving me a chance to say a word. I should like to say just one thing about the influence which, it seems to me, this Society and the society at Boston are exercising upon the people of Massachusetts. I grew up in Worcester County, and was a regular visitor and occasional exhibitor in this hall in my younger days; and at that time the fact that the Society was here and in a prosperous condition made very little impression upon me. I enjoyed coming here, and enjoyed the competing and witnessing the exhibits of others, but since then I have been in districts where there were no active horticultural societies, at least not as active as this, and I see what those communities are missing. As I reflect upon it, it seems to me that the men who founded this Society deserve a great deal of credit, more credit than I imagine a great many of us are inclined to

recognize. The societies, both this and the one in Boston, are influencing the children now, they are teaching the children now horticulturally in their work in weekly exhibitions, and I doubt if any educational institution will succeed in improving very much upon the method that the society has adopted. I wish myself that there could be a closer co-operation between the horticultural societies and the public schools. I have watched very carefully the suggestions along this line, but I fail to see yet what seems to me a satisfactory solution of the case. However, the societies are established, and I see no reason why they should not go on generation after generation. Their income is provided for, and all that is necessary is for a judicious management of the funds and the weekly exhibitions can go on. The best way in the world to encourage the children to practice horticulture is to offer premiums, which this Society and other societies are doing.

When I was a boy I exhibited here. I was surprised in looking over the Transactions of the Society to see how long ago I used to come here, and I saw accounts of premiums that were awarded in the Transactions that left no chance for doubt but that I received some benefit. I believe that I received the most valuable elementary education that I have ever received, under the auspices of this Society. Not only the exhibitors are influenced by the exhibitions, but a class of people who care nothing for horticulture other than the fruits and vegetables which are grown in the country. They receive valuable lessons at the exhibitions. This in a way prepares a market for choice products that can be grown by members of this Society. I thank you, Mr. President.

The Toastmaster.—The principals of the two high schools are guests here to-night. We shall hardly be able to give them both a chance to speak, so that we shall have to split the difference between the two. I think it would be the right thing to give Mr. Lewis, the principal of the English High, a chance to repudiate the aspersion that was cast upon him by the mayor.

Mr. Homer P. Lewis.—*Mr. President, Ladies and Gentlemen:* I am afraid I shall not be able to do that. I must con-

fess to considerable uncertainty in my mind when I attempt to answer satisfactorily to myself why I am invited to speak at a gathering of horticulturists, where your speakers, no doubt, are expected to illuminate more or less some horticultural subject. I hope that your committee thought I looked like a horticulturist, if so, I feel flattered decidedly. I am in the condition of the three men in the story, which you may all have heard,—of the Englishman and the German and the Irishman. They met and the Englishman in his pride was telling how he was often taken for the Prince of Wales. The German replied that that was quite a coincidence, that he was often taken for the Emperor William; and Pat said, "I met a man the other day and he cried out, 'Howly Moses! is that you?'"

My own training and work has been altogether in other lines, and I am rather dismally conscious that if I attempt to speak on a subject appropriate to the evening, I shall simply make a spectacle of myself, wading about in my own ignorance. Some years of my youth and some in later life were spent, however, in digging earnestly after Latin and Greek roots with more or less success. I think I know fairly well at what season the seeds of these varieties may best be sown, and what sort of soil should be selected, and in what sort of soil dry-rot is encountered. I am frequently told that I have been working at the deadest kind of dead roots and could not possibly find a sale in any up-to-date market. Then I have some knowledge of algebraic roots, cube roots, and roots of all sizes and shapes; and so many unknown quantities enter as factors into this branch of gardening that it should not be undertaken by anyone who expects more than fairly certain returns, in fact, personally, I should be inclined to place algebraic roots little higher in the scale than that other variety, dead-beats.

I have had considerable experience in keeping hens, and it may puzzle some of you to see the connection between hens and horticulture; but if you happen to be a hen fancier and your neighbor has a fancy for a garden you realize that you don't need to puzzle yourself about the connection, the hens look after that. I did try once, I recall, to have a garden and keep

hens at the same time. In the innocent guilelessness of my inexperience I reasoned in this wise, that the hens, if properly treated and well instructed, would realize that they had certain duties to perform and they would go through the garden and yard and destroy all the worms and insects injurious to vegetation, but I found that the gray matter does not predominate in the brain of the hen. Those hens of mine got all mixed up as to their duties and seemed to think that they must destroy the vegetation lest it might be harmful to the worms and insects. I remember that I had one that I named "Maud" because she was continually hearing an invitation to "come into the garden." Then for her—

> "Stone walls did not a prison make,
> Nor wire fences, a cage."

But she answered the invitation. It is but just to myself to say that my experience in gardening was extremely brief.

I feel that it would be hardly proper in this presence to speak without recounting to some extent what the world owes to the horticulturist. On such occasions as this a society of this kind has a right to feel a little proud and to boast of what has been done in the past, and to hear good things said of itself. Why, at the annual banquet of the Granite State Society we boast without fear of contention that the garden of Eden was in New Hampshire, and the serpent was unable to obtain the price of admission. We then claim, and we have the authority of a well-known horticulturist to back up the statement, that the first land to rise above the water in the beginning of things was the southeastern part of New Hampshire. It has been objected by a doubting Thomas that this runs counter to Genesis when it says that the Lord after he had created the land looked upon it and pronounced it good, and no one could for a moment think that that could apply to the land of southeastern New Hampshire. Of course we made light of that objection.

Now to come back to my point which is the service done for mankind by the horticulturist. Some years ago I chanced to study somewhat carefully the condition and manner of living of

the English laborer and farmer. During the last five or six centuries it was surprising to find to what a narrow range of vegetable food the diet of the English was confined in that period. In the 14th century, wheat, rye, oats, and beans furnished the material for the vegetable food of nearly all the Englishmen. There were practically no garden vegetables and few fruits. Come down to the beginning of the 18th century and we find no improvement in the monotony of such a diet from one year's end to another. The English farmer of that period was not progressive, and did not take kindly to the idea of any new vegetables. He learned very slowly and unwillingly from his more advanced Dutch neighbor. It was, I believe, Lord Townsend, who, after his alienation from Walpole, retired from the ministry and then set the fashion of Gentlemen farming in England. He devoted himself to the introduction of new vegetables, the improvement of the varieties already existing, and to making converts to horticulture among his friends. In a short time a great number of the English nobility and men of wealth imitated his example and it became the rage in the latter part of the 18th century. "It was to these men," said Rogers, "men engaged in business and politics, who pursued agriculture or horticulture as an avocation, that England owes at the present time her prominence in the variety and excellency of her fruits and vegetables. The diversity of the food of the people is a very good indication of its civilization—some accounts say that it was in a great measure the cause of their civilization. If this be true, we can certainly affirm that the men who have been moved by the spirit which animates this Society have played no unimportant part in the progress of mankind.

The Toastmaster.—The Fruit Growers Association of Massachusetts, a society organized in our hall some two or three years since, is holding its annual session in our hall today. Some of the members are present and among them its president, who is one of the oldest members of our Society. I have the pleasure of introducing Mr. George Cruikshanks.

Mr. George Cruikshanks.—There is one thing that I will take advantage of, and that is the opportunity to bring to the Worcester County Horticultural Society the greetings of the Massachusetts Association and will express the hope that the seeds of horticulture that were sown by the founders of the Worcester Society may continue to grow and prosper more luxuriantly in the future than they have in the past.

The Toastmaster.—The President reminds me that the limit to the exercises of a literary character is now approaching, and there is time for only one more to speak. As usual I have reserved the best wine till the last. You may remember of my alluding to a guest last year who left his speech unfinished. He is a member of the Massachusetts Society and has a military title. We are honored in having two generals here this evening, General Appleton and General Wilson. I have the honor of introducing General Henry W. Wilson.

General Henry W. Wilson.—I had hoped you would draw the line at the General, I do not claim it, I am not entitled to it. I hardly know what to say in this presence. The hour is getting late and my ideas are slightly mixed. You are impatient to go, and I feel that what I might say would not interest you. I would like to finish my speech, but really I have forgotten what it was, and consequently it might not be of any advantage to you. I have been thinking what a pleasure it would be for us in Boston if we could enjoy such an occasion as this. We have all the evidences of material prosperity, and we have a hall that is valued at $700,000, and it is all paid for. We have a library of untold value. We have investments of funds which will make us wealthy beyond the dreams of avarice; then we have a membership of one thousand, and I have never witnessed there such an occasion as this. We run the whole gamut of social life from the millionaire who counts his millions down to the man who delves and toils in the soil for for his daily sustenance, and to get them together on a social plane is a physical improbability, still they get along harmoniously and do their business properly. The social element we

have not at all, and it is hardly thought to be possible; that is one thing that we have missed, one thing that is delightful. That is one reason why I am pleased to be here to talk with you. I came last year with something on my mind, what it was now I cannot think—it is no matter. I had sat and listened to the remarks about the school, the introduction of botany and gardening. Well, that is a nice thing to do provided you do not introduce another text-book and put another burden on the teacher. The great trouble with our whole system, that was inaugurated as I left the school just fifty years ago, is, we make slaves of our teachers and ignoramuses of our children. All the time that I had children in the Graham school near my house, I was trying to impress upon the principal of that school the fact, that I had discovered from examining the boys' lesson papers, that he was simply teaching the children what I taught my children at home. They taught them nothing in the schools, and I think if I had grown up under the system which now prevails in the schools of Boston, that I should have been an ignoramus myself, which I am not.

We have one school in Boston that is a sample for the schools of the Commonwealth, and the same system that has been adopted there can be adopted everywhere with success provided the teacher is an enthusiast in the study of botany and horticulture. Water will not rise higher than its source. The J. A. Andrews school in West Roxbury (Mr. Platt is the master) is the one I refer to. Mr. Platt has dug up and prepared a part of his yard, and encourages the children to scatter through the woods and fields and bring in some of the native plants. He discusses it and gives it a name, and they put it in, cultivate it, and watch it blossom and see if it thrives. This sort of instruction is useful. There is a good deal lacking in the matter of music in our public schools. There are many who cannot tell Yankee Doodle from Old Hundred, and there are many who cannot tell an orchid from an oak. It is idle to teach one music and teach one horticulture when he has no taste for it.

I want to say something to you practical about horticulture. We have in Massachusetts the men who best understand horti-

culture that live on this planet; we have the best farmers; we raise the best pinks and roses, everything from an orchid to a cucumber in perfection. We have the best market for the man who lives on what he raises on his acres. We have within fifty miles of Boston the most generous living people on the face of the earth, a population that will live generously and who know how to live. There is no gainsaying the fact. What you want to do is to meet the demand which they make to the highest degree.

From the earliest records which we have in this country, we have a continual repetition of the drought, drought, drought. The very best and most fruitful lands, under proper conditions, are oftentimes barren because of the drought. The annual precipitation of moisture that is necessary for the perfect growth of vegetation is from three to four inches per month. If there should be in a month not more than one inch it makes it impossible to obtain the best growth, and if there is no water at all there is commonly a prostration of the crops. An old farmer told me, a man seventy-three years of age who cultivates the farm on which he was born, "Mr. Wilson, I have in a long life been cultivating the soil exclusively for my support. There has not been a year that I can remember when, during some month in that year, I have not been anxious about my crops from the effects of the drought. I never knew what it was to have perfect satisfaction in the cultivation of my fields until I got water, a water trough with which I could supply the deficiency of nature. I happened to be in a town where water was introduced as a system for supply. The farmers soon got on to the fact that irrigation was profitable in Massachusetts. One used it, another used it, and in a very few years they exhausted the supply. There was not enough for so many. Then they were all cut off, but they had found that it was useful to have a supply with which they could make up for the deficiency of nature. They found by meter that they used two million gallons in one year, for which they paid six hundred dollars, twenty cents per thousand gallons." One who was educated up to the point that water was useful and profitable and that he could

afford to pay twenty cents per thousand gallons. He found that by an expenditure of about three thousand dollars he could get a supply of eight million gallons. The first year he had five acres of strawberries, and the drought in the month of May cut off the strawberry crop, and on that five acres of strawberries he cleared three thousand dollars more than his neighbors on the same ground. The next year was a repetition of the same experience. Thus you see the importance of using water, having it to control through various agencies in order to make good the deficiency of nature. Now the farmers and gardeners of New England are not aware of the means which they have at their command. They do not fully realize how easy it is for them from a neighboring brook or pond or by making artificial reservoirs and using the natural supply of water to obtain the necessary amount for the successful raising of crops. I find men raising a crop for ten dollars when they might raise one for one hundred dollars.

Some years ago, perhaps ten, I boarded during one summer with a farmer in the southeastern part of New Hampshire. The land sloped to the south. It was a light, warm, sandy, loamy soil, and that man was raising milk on his farm. He was keeping seven or eight cows, raising potatoes and corn, and that was farming! I observed his operations and took notes of what his business might be. One evening we had a colloquy. "My friend," said I, "as near as I can make out all you get for labor is a pile of compost in your barn-yard. What you get for your milk at the station is just equivalent to the value of your hay on the cart when you put it into the barn. And so all of your trouble in piling that hay into the barn, cleaning the stock and milking them, and the whole work and burden of your life, is thrown away, and all you have to show for it is a pile of compost in the corner of your barn-yard. Is that a practical way to look at it? Is that a valuable equivalent to your life's labor?" He did not know. He knew no better life, for he had been brought up in the old school.

A quarter of a mile away was a pasture. A little brook came down through it. It started on a side-hill and I had been

there fishing and had discovered that it would be an easy matter and but little expense for the water to be brought down and spread over the land. The total cost would not be over two hundred and fifty dollars. I opened the subject to him and took him up and showed him how easily it could be done and figured up the expense. And you never saw such a bewildered look as that man put on as he contemplated the scheme. He still keeps his cattle and is still raising milk on that farm. That is a type of many men.

The horticulturists of this State should awaken to the fact that they have all about them the facilities, the means, and the supplies of water to combine together and divide up among them.

I knew of a farmer who thought he would like to sell some to his neighbors to help pay the expenses, but when he got the water he had three times as much as he had ever used before and he wanted to use it all himself. And the result is that today there is scarcely a celery plant that is raised as it was twenty years ago about Boston. And I think that there are millions of celery plants growing up by irrigation where twenty years ago not one celery plant could be raised without irrigation. It seems to me that they have the cheapest supply that you can find anywhere. For seventy-five dollars you can get a little machine that will carry the water to any point.

There is one thing that we want to observe. Some men think they must have a little pipe with an attachment for sprinkling the water on the soil. But that is a great mistake. The application of water to the soil must come without cooling the atmosphere. We want the hottest sun and the brightest skies and there is no one thing that grows that is benefited by the sprinkling of water. Some say it is like the natural fall of water by rain. That may be all very true, but if you had all rainy days in the year you would have very few crops but grass, and that would mildew. What we want is a large volume of water at our command, one hundred or one hundred and fifty thousand gallons, a quantity which will enable men to drench the land and make good the deficiency of nature. I have, Mr.

President, been trying for the last twenty years to inculcate on the farmers and horticulturists the fact that they can, if they will, have the resources which nature has placed at their disposal for the cultivation of the soil.

THE TOASTMASTER.—I have a letter from the oldest member of the society, one of the original charter members, Mr. Hathaway, who is unable to be present on account of ill-health. I am sorry that I have not time to read it but I will give it to the secretary for publication.

ENFIELD, CONN., March 1st, 1898.

OBADIAH B. HADWEN, ESQ.,

*President Worcester County Horticultural Society:*

MY DEAR SIR:—It is with exceeding great regret that I find myself compelled by reason of lumbago (not plumbago) in the back (that prevents me from walking upright righteously), to decline your kind invitation to attend the annual banquet of your Society, and to answer to a promised call of your venerable toastmaster, who shows no visible signs of any cruelty of the heart, though he makes hearts to tremble if he "doth but carelessly nod at them," but I tender you a few suggestions, which if you think worthy and time will permit you can have offered there as from an antideluvian of a former age, one of the few, I believe but two, of the charter members, the one-dollar disciples of this association, who were in at its birth, H. H. Chamberlin being the other. Again you gather within the hallowed shrine of memories sweet of bygone time. From the walls they look down upon you with benignant smiles of welcome. The leaders and the beloved comrades of the foregone. The "living present" is wreathed with garlands beautiful culled from the gardens of the past, sweet scented with memory's enduring fragrance—of fathers and mothers, sisters and brothers, who now cultivate the immortels, where flowers fade not, in the garden of the Lord. Mingling here with the white chrysanthemums of the silver tops are the full blown roses of womanhood, the blushing buds of girlhood and of young manhood, wearing the dudish boutonnière of pride stuck in their buttonholes!

Perchance our venerable, long-loved President speaks his words of welcome to *thee* and *thou*, but alas! *not* to me. Wisdom, wit and eloquence flash their thoughts from lips of eloquence touched with the fire of the gods. On a subject of deep interest a few thoughts may not be inappropriate.

ELM PARK—should it not be LINCOLN PARK?—where our beloved assistant gardener of the Lord helped Nature to carry out her designs of beauty, and not to thwart them with the arrogance of man trying to improve on God's plan.

He wrote his name on the meadows green of his childhood's home, to keep it as fresh and green as the arbutus, the hemlocks, the spruce and the pines, living characters, with which he wrote love-letters to the gods of the beautiful to consummate his designs. Loving hearts there are who feel that his work should ever remain as he left it, forgetting that "change and decay is the law of Nature," and to develop its beauties and make them steadfast the prudential hand must clear away Nature's decay, and give her full sway to carry out his design of the beautiful.

Old NEWTON HILL, a grand monument of his love. And from its summit high, Faith with prophetic eye discerns afar its wrought out beauty his genius has planned.

HADWEN PARK! The Quaker home of our President, with its broad avenues lined on either side with the shivering maples, the lofty elms, and the dark cool evergreens his hand has planted there. But above the trees and the shrubs is the quiet Quaker love that has made his garden beautiful, an unabridged dictionary of Nature that spells out the mysteries of every clime with its trees and shrubs and vines, transplanted from their native soil and nurtured by his loving care. He knows them all, and calls them by their names—

> And they lift their golden petals up,
> Wave their leaves of silver sheen,
> Of blue and red and green,
> As he walks their ranks between.
> King of the garden beautiful.

The rarest horticultural exhibition of all New England.

INSTITUTE PARK.—Another misnomer, for it should be SALISBURY PARK, for no other name "doth become the mouth as well." No other name will tell of the three Stephens, who have made so large a part of the history of the village, the town, and the city of Worcester; a park of beauty, yet characteristic in that only *one* column stands alone and lonely, with no mated goddess of beauty standing by its side to help uphold its crown of loveliness. Yet, while there is life, there is hope, and, young ladies, a great responsibility devolves on you to see to it that this living column be suitably mated!

DAVIS PARK.—Another monument of another heart's true lover.

Bigelow's Park, and Historical Society Park.—

All on the banks of Old Long Pond,
Now modernized to Lake Quinsigamond.

The Old Heart's inland sea of pleasure and beauty, a breathing spot of the rare air of vitality, a free bath where dirty humanity can cleanse its outward form, and as "Cleanliness is next to Godliness," help to purify the soul within. God, when He made it by pouring the waters from the hollow of his hand to cover the land, gave it in fee simple to all his children for all time, share and share alike; and later Gershom Rice when he built his log hut in the little hamlet in the wilderness, caught fish there and obtained a preëmption title which has come down to his descendants following, and it is today as free as the air above it—free to all hearts that love it.

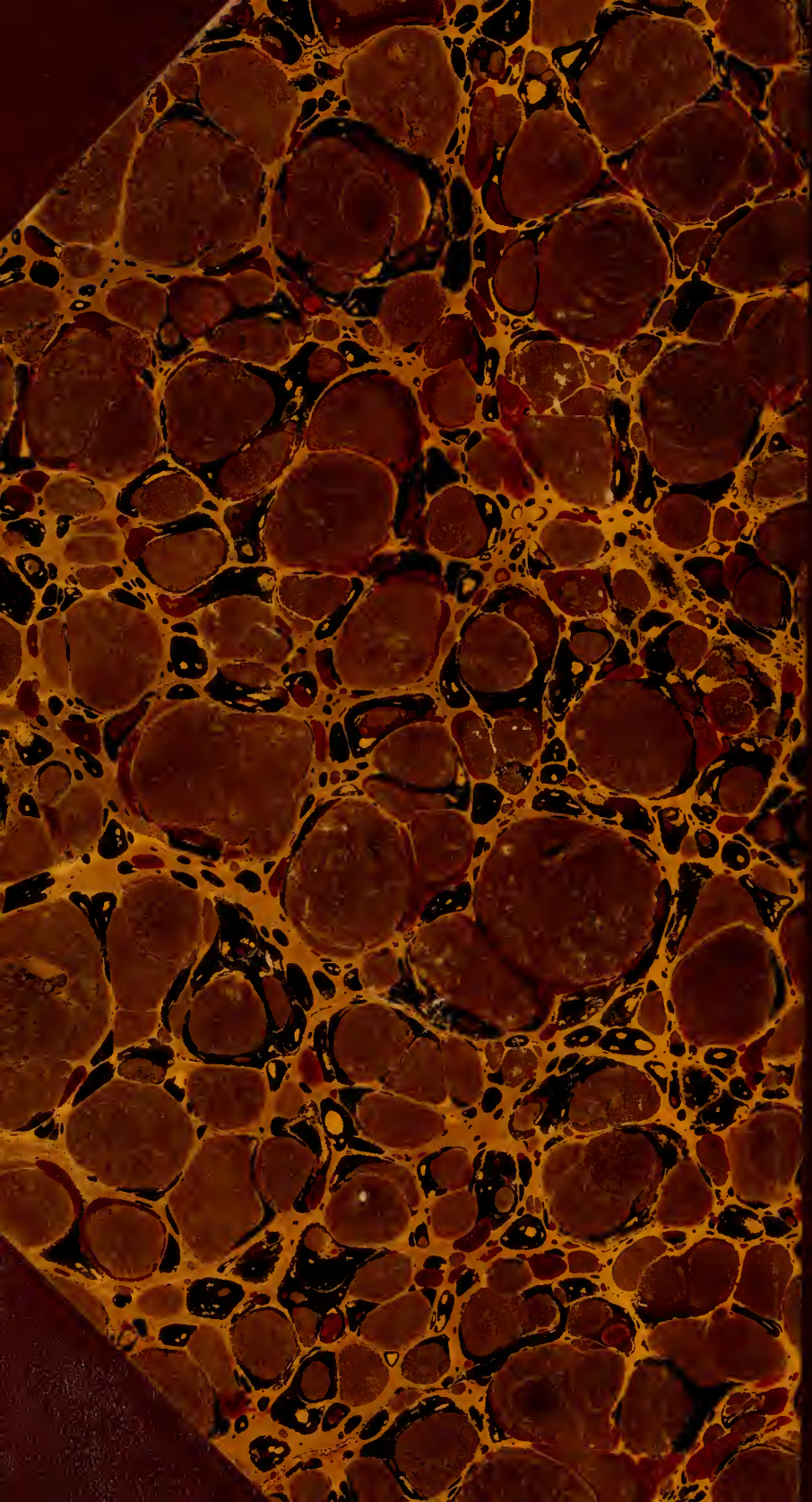
University Park.—Where Dr. Hall teaches the science of beauty from the open book of Nature, and where Dr. Hodge cultivates the toads. He has published a full history of the toad in a one-fourth ounce vial edition, of which he kindly gave a volume to teach me and other numskulls that the toad is the progenitor of the tadpole, the pollywog, the bullfrog, and I don't know but of the sea-serpent, the hippopotamus, the crocodile, and all the amphibious tribe. Well, science is mighty and we can swallow much at its dictation, like as the toad swallows the worms and the grubs, working benefactors of horticulture and agriculture. Long may he live to preach and to practice, until mounted on the hobby-horse of science he shall ride into the kingdom, where the toads come not, nor the naughty boys save through regeneration.

This Society is no more a mere garden for the cultivation of fruits, flowers and grain for ornamental prize shows, but it is a power in the land—the school of science to study out the wonder-working of the power divine and teach them to all mankind. It has been a great factor in cultivating the taste of the beautiful to adorn the homes that makes this Old Heart of our hearts so *very* beautiful. The fruits, flowers and the golden grain are the Christmas gifts the Santa Claus of God's love brings to all his children. Here and there and everywhere are those with stockings crowded full, and *here* and there are those whose stockings have holes in their toes and cannot hold their share of its blessings. But all over the world generous Mrs. Taylor's cry, "Divide! Divide!" and all are warmed and clothed and fed and housed, even to the quaint, sharp newsboy tribe. The cry, "Oh, my, didn't I get two plates of turkey and two pieces of mince pie! Whoop 'er up for Mrs. Taylor. She's no snip

on the shares,—but she's got lots of *Cabbage!*" And we can pardon his enthusiasm for we have learned she has more, and better, a heart of sympathy and a hand of liberality.

As the centuries move on with the heavy tread of the Callenic step of years may this Society be found in the fore ranks of industry,—plowing, sowing, hoeing, growing; and may the crops it cultivates ever be the ultimatum of good, noble manhood, and loving womanhood,—and my closing toast shall be:—

FLOWERS.

Trembling pilgrims of springtime hours,
That spring up from Earth's silent bowers,
In buttercups, daisies, and the yellow dandelion
Each in the image of its scion;
Through the evolution of the ages
The Monkey has become the Man—
And the toad progenitor of all the amphibious clan.
Ere the earth was made, Mayflowers
Floated on Chaos' unknown sea,
Guided by the light and the song of the stars—
Born of germ seed dropped from the Red Planet Mars.
The yellow primrose is to some
Only a yellow primrose still,
While to the cultivated taste it hath become—
In this progressive age—golden drops
Of God's mint of coinage,
The brightest gem of Earth's coronet
Is not the rose, the pink or the violet.
But throughout the kingdoms human
It is God's last, best gift—
The Queen flower—*Woman!* H.

THE TOASTMASTER.—We are sorry that we are unable to call upon our other guests, but time forbids, and by order of the president, this meeting is adjourned to the floor below.